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# TIGERPAPER

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## International Consultation

## on

# WILDLIFE RESOURCES FOR RURAL DEVELOPMENT

## 7–11 July 1980

## Hyderabad, India

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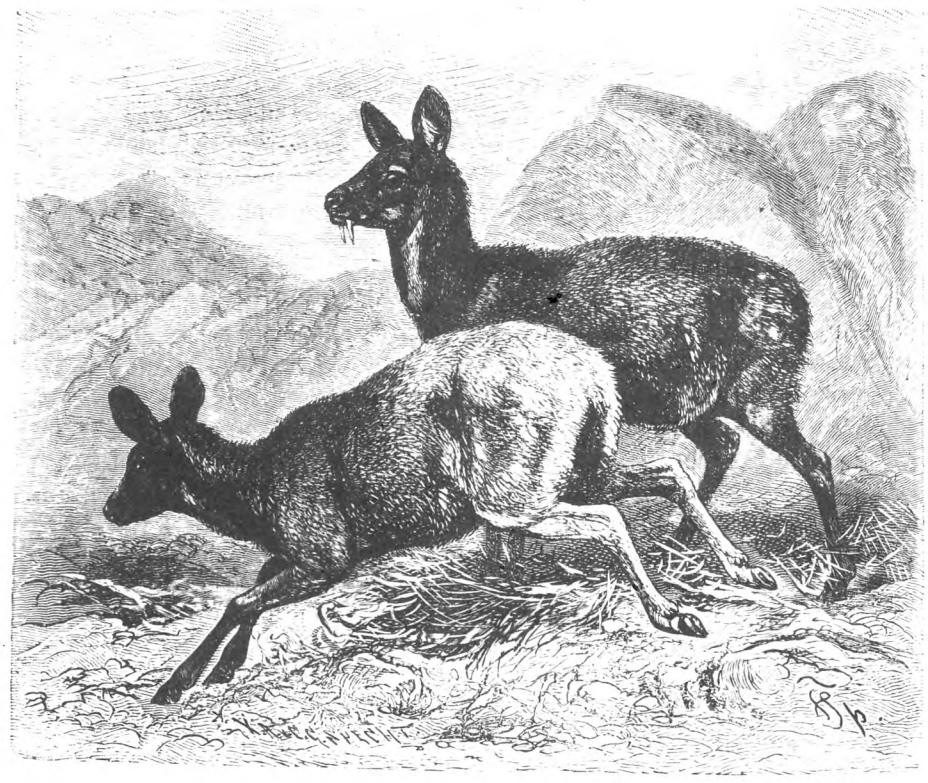


*Musk Deer*

# REPORT ON THE INTERNATIONAL CONSULTATION ON WILDLIFE RESOURCES FOR RURAL DEVELOPMENT

**Hyderabad, India**
**7–11 July 1980**

## INTRODUCTION

The International Consultation on Wildlife Resources for Rural Development in Asia and the Pacific, held at Hyderabad, India, from 7–11 July 1980, is the first of its kind to be organized by FAO. The FAO Regional Office for Asia and the Pacific organized the Consultation in collaboration with the Andhra Pradesh Agricultural University and the Andhra Pradesh Forest Department to encourage the reorientation of policies relating to promotion, conservation and utilization of wildlife resources primarily to meet the needs of rural people more fully and directly.

An all important segment of our population who have a direct interest in the conservation and rational utilization of wildlife are the people dwelling in or on the fringes of the forests which are also the habitat for wildlife. The cooperation of these rural people is required if wildlife resources are to be conserved and utilized rationally. Such cooperation, however, will be forthcoming only if they see that wildlife resources are managed primarily for their benefit.

The Consultation, attended by more than 80 participants, grappled with this challenging subject of great relevance at a time when the approaches, policies and programmes in this field are in a state of evolution and development. It helped to provide the necessary guidelines for the management of this significant resource for the benefit of rural populations and made several recommendations of practical value.

# RECOMMENDATIONS

The Consultation deliberated for 5 days on the various aspects of Wildlife Resources for Rural Development. It recognized the great potential of wildlife resources conservation and utilization for the benefit of rural populations.

It also identified problems, constraints and the needs, at national, regional and international levels. The Consultation acknowledged that the involvement of rural people in all activities of conservation and utilization of wildlife resources is essential.

After discussing the various papers and views, the Consultation approved the following recommendations:

## (1) WILDLIFE FARMING

In several countries of the Region, there is a growing recognition that wildlife farming is one of the methods that can be adopted to utilize wildlife resources for rural people. However, such farming, to be beneficial, useful and successful, should involve carefully selected species and will require a great deal of organization.

The choosing of wild animal species suitable for farming, requires detailed knowledge on aspects such as, rate of reproduction, meat yield, resistance to diseases, behaviour under controlled conditions, ease of rearing, quality of product, market for the product, and economics of the enterprise.

Considering the complexity of initiating wildlife farming, the Consultation recommended that FAO should assist in carrying out the following activities for setting up wildlife farms, particularly in rural areas.

### (a) Survey of wildlife farming activities in the Region

The survey of wildlife farming activities currently in existence in the different countries in the Region should be systematized and strengthened. Special attention should be paid to the design, parameters, the size, the species, method of management and other relevant features.

### (b) Techno–economic studies

Techno–economic evaluations of specific cases of wildlife farming in selected countries should be carried out in detail and circulated to the countries of the Region.

The methodology for carrying out such techno–economic evaluations on wildlife activities should be detailed in a manual. It should be made available to the countries to enable them to carry out location specific studies.

### (c) Market studies

Market studies on specific wildlife products of significance to the Region should be conducted. Such studies should provide information not only on the demand and supply situation for each product in specified areas or market centres, but should also deal with trends in prices and volume of trade. There should be an indication of forecasted price trends, especially in a situation of increased supply, to assist in the promotion of export markets.

It is also recommended that the methodology for carrying out such market studies should be detailed in a manual so that each country, and even each province in a country, can carry out its own studies for local markets.

### (d) Participation of beneficiaries

No rural development programme can be successful without the active involvement and participation of the intended beneficiaries. Therefore, the Consultation strongly urged that the rural people concerned should be involved in and associated with the planning, development and operation of the programmes, including the equitable sharing of benefits.

### (e) Wildlife farming policies

The Consultation urged that wildlife farming should not adversely affect the conservation programmes. Wildlife farming of non–endangered species should be taken up in suitable areas. However, wildlife farming should be outside National Parks, Sanctuaries and Reserves.

## (2) DEVELOPMENT OF BUFFER ZONES

Buffer zones are areas around national parks, sanctuaries and reserves where wildlife is protected. However, buffer zones, when appropriate, may be used to meet certain needs of the local people.

### (a) Buffer zones as sources of rural economic activity

It is possible to enlarge the scope of utilization of buffer zones. Buffer zones can be used for generation of employment, income, and production of food for the local people.

### (b) Management of buffer zones

Further studies on the management of buffer zones was recommended.

### (c) Pilot projects

Pilot projects incorporating the most feasible features should be started in selected countries. These pilot projects should be funded by UNDP or other sources and executed by FAO in close collaboration with the countries concerned. A network approach is

strongly suggested.

## (3) TRAINING ACTIVITIES

The Consultation recognized that there is an acute shortage of trained personnel in wildlife management in the participating countries. The current wildlife programmes are suffering from lack of properly trained manpower.

Therefore, the Consultation urged that training programmes should be initiated, and then strengthened and organized on a systematic and regular basis both for formal training and for in–service training.

Training activities should cover all aspects of wildlife management, including health cover and disease resistance. Facilities for imparting training of a highly professional nature as well as technical and vocational type of training should be provided.

Many countries may develop facilities for training at lower levels. Yet, there is an urgent need for regional co–operation in promoting training at the technical and professional levels.

The Consultation, therefore, recommended that:

(a) One or more **Regional Schools** for Wildlife and National Parks Management, to impart higher level professional training and conduct refresher courses for professionals, should be established. Indonesia already has a functional basis for such a school and it should be expanded and strengthened.

The existing facilities for training in the field of Wildlife Management in India were explained. In view of the ecological diversity of the country and the facilities at present available in wildlife training, particularly in crocodile breeding and management, these facilities should be expanded and strengthened.

(b) The Consultation considered the urgent need for training the upper level field personnel and upper level management personnel in wildlife and parks management. The Consultation further recommended that these middle level training facilities be strengthened where existing or established and be located in different sub–regions to meet the specific needs of the RAPA Region. Suggested locations are:

| | |
|---|---|
| South Asia | – India |
| South–East Asia | – Indonesia |
| East Asia | – China |
| Pacific | – Papua New Guinea |

### (c) Development of curricula and research

It is recommended that appropriate curricula should be provided and research programmes in the Universities on wildilfe management should be supported.

Universities should also be encouraged to offer post–graduate courses in nature conservation, national parks, and wildlife management.

### (d) Training course for effective implementation of legislative measures

Training courses for Government officers dealing with wildlife legislation, rules and regulations, should be organized. Study tours, where necessary, should be organized for the wildlife officers concerned to observe the enforcement of wildlife rules and regulations.

## (4) REGIONAL AND NATIONAL CONSULTATIONS

The Consultation appreciated the initiative of FAO in organizing the first Consultation ever to be held on wildlife resources for rural development. It acknowledged that this Consultation is most timely and useful. It requested FAO to continue to support such consultations.

(a) It is recommended that Regional Consultations on Wildlife Resources for Rural Development should be held once every two years. The venue should be rotated among the countries of the Region. It requested FAO to take necessary steps to arrange the second consultation in 1982.

(b) It is also recommended that National Workshops should be held to discuss problems in managing wildlife for rural development; to develop approaches to solutions; to implement the feasible solutions by stages; and monitor and evaluate the measures taken periodically. FAO's initiative and assistance was requested in this regard.

### (c) Specialized training.

The Consultation recommended that FAO should support specialized training whenever such proposals are received.

Examples of such training may include:

- Wildlife farming training by China, Indonesia, New Zealand and Papua New Guinea;
- Elephant management in Burma, Thailand, and India;
- Crocodile training and management at the Central Crocodile Breeding and Management Training Institute at Hyderabad, India, supported by UNDP/FAO;
- Continued BIOTROP training on Wildlife and Parks Management.

These training programmes should be of short duration.

### (d) Study tours and fellowships.

It is recommended that study tours and fellowships should be an integral component of the Regional Project.

## (5) CO–OPERATIVE MEASURES ON WILDLIFE AND NATIONAL PARK MANAGEMENT.

### (a) Membership of CITES.

The Convention on International Trade in Endangered Species of Flora and Fauna (CITES) is a very important convention and its members are required to establish a Scientific Authority (to deal with biological aspects of trade ) and a Management Authority ( to deal with mechanics of trade ). This promotes an international network of management and scientific institutions working in collaboration with each other.

Therefore, the Consultation recommended that all countries of the Region should take steps to become signatories and to ratify the CITES convention.

### (b) Membership of other International Conventions.

It is recommended that the countries of the Region should also join the World Heritage Convention; the Wetlands Convention and the Migratory Species Convention.

### (c) Regional Convention on Wildlife and National Parks Management.

Currently there are 4 special International Conventions dealing with the different aspects of management of Wildlife and National Parks. However, these Conventions may not be wholly applicable to the conditions that are prevailing in the countries of the Region. Therefore, it is recommended that a Regional Convention on Wildlife and National Parks be established and this Convention should deal with:

(i) Standardization of Terms;
(ii) developing regional standards for managing parks and reserves;
(iii) Providing mechanism for regional co–operation in migratory species;
(iv) promoting establishment of international reserves;
(v) promoting research in conservation which has regional applicability;
(vi) develop an *Asian and Pacific Manual of National Parks and Wildlife Management* which should be published in English and the national languages of the countries.

It was recommended, however, that the Asia and Pacific Forestry Commission at its next session should consider this proposal in greater detail, including the implications for the countries that may consider becoming signatories to the proposed Regional Convention.

### (d) Information Exchange

(i) A system of information exchange can be developed through (a) regular meetings; (b) news publications; (c) technical journals. Such exchange of information is essential for increasing awareness and successful implementation of both the national and international programmes on Wildlife Conservation and National Park Management.
(ii) It is recommended that the publication of *"TIGERPAPER"* should be continued and if necessary expanded into a bi–monthly in view of its popularity in the Region.

Countries in the Region are very appreciative of this very useful publication and requested FAO and UNEP to continue and expand this publication.

In addition to the *"TIGERPAPER"*, a new technical publication should also be undertaken by the FAO Regional Office. The suggested title of the journal is *"Journal of Asia and Pacific Region for Wildlife Conservation and Management of National Parks"*. It would serve as a stimulus to the development of parks and wildlife management, and circulation of existing literatures.

## (6) STRENGTHENING NATIONAL WILDLIFE SERVICES

It was recognized that there is a shortage of staff devoted to the development of wildlife and parks. It is also clear that adequate support in respect of personnel, funds and facilities is needed in several countries.

Some countries have wildlife programmes within the Forest Departments and others operate wildlife and parks activities separately. It was recognized that there is a need for an identifiable wildlife and parks service. This will also encourage the establishment of a trained cadre of personnel to man the increasing tasks and requirements.

## (7) EDUCATIONAL PROGRAMMES ON WILDLIFE RESOURCES FOR RURAL DEVELOPMENT

One of the important reasons for the inadequate support from the public as well as from politicians and administrators for wildlife development programmes, is the lack of awareness and proper appreciation of the problems. Therefore, the Consultation strongly recommended that all measures should be taken to launch educational and publicity programmes in this regard.

## (8) RESEARCH

It is recommended that the priority areas of research in the field of wildlife conservation and mana-

gement of national parks, including health cover and disease management for the benefit of rural people, should be identified and supported with funds, equipment and expertise, by international organizations if necessary.

### (9) REGIONAL PROGRAMME/ PROJECT ON WILDLIFE MANAGEMENT FOR RURAL DEVELOPMENT

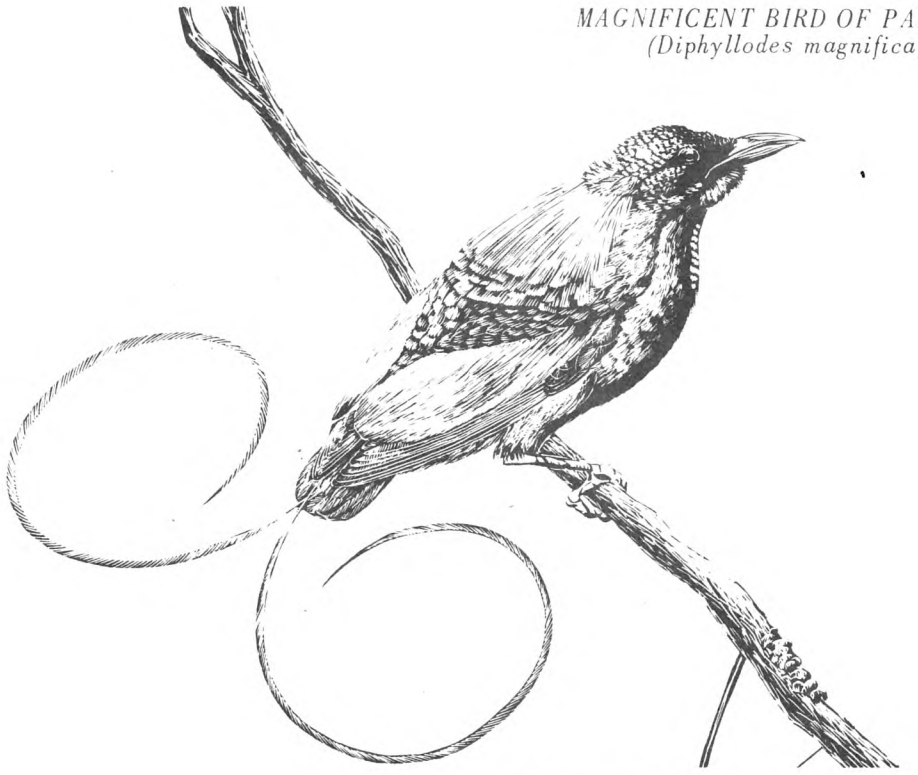
The Consultation acknowledged that there are several problems and constraints common to the countries in the conservation and utilization of wildlife resources for improving the nutritional, social and economic status of rural poor. This approach was also emphasised by the World Conference on Agrarian Reforms and Rural Development. In this connection the Consultation considered several of its recommendations and decided that a co–operative approach and effort would be more beneficial in solving the problems of the Region.

The Consultation, therfore, developed a regional programme/project with emphasis on Technical Co–operation Among Developing Countries (TCDC) with maximum utilization of national institutions. It formulated a project proposal and requested the Director–General of FAO to secure financial assistance from UNDP or other funding sources on a priority basis.

The Project emphasis is on the network approach and the linkages with the national programmes.

The Project Proposal is appended to the Report of the Consultation. The proposal provides a brief outline and the full project will be formulated on the basis of the report of a Preparatory Assistance Project.

*MAGNIFICENT BIRD OF PARADISE*
*(Diphyllodes magnifica)*



## ACKNOWLEDGEMENTS

The whole–hearted cooperation and assistance received from the following in organizing the Consultation is acknowledged:

- Andhra Pradesh Agricultural University, Hyderabad
- Andhra Pradesh Forest Department, Hyderabad
- Andhra Pradesh Forest Development Corporation, Hyderabad
- Central Crocodile Breeding and Management Training Institute, Hyderabad

In particular, the Consultation owes its success to the enthusiastic cooperation received from Mr. P.S. Rao, Chief Conservator of Forests, Mr. A.K. Mathur, Additional Chief Conservator of Forests and Liaison Officer of the Consultation and Mr. Pushp Kumar, Conservator of Forests (Wildlife) of the Andhra Pradesh Forest Department.

# INAUGURAL SESSION

1. The **Regional Consultation on Wildlife Resources for Rural Development** was held at the Jubilee Hall, Hyderabad, India, from 7–11 July 1980. It was attended by delegates representing the People's Republic of China, India, Indonesia, Lao P.D.R., Nepal, Papua New Guinea and Thailand. Representatives from international organizations: UNEP, UNESCO, and WWF also attended. A total number of 85 participants attended the Consultation. The list of participants is given in Appendix I.

2. An address of welcome and opening statement was given by Dr. D. Bap Reddy on behalf of Dr. E. Saouma, Director–General of the Food and Agriculture Organization of the United Nations and Dr. D.L. Umali, Assistant Director–General and Regional Representative for Asia and the Pacific Region. Addresses of welcome were also given by Mr. J. Ragotham Reddy, Vice–Chancellor of Andhra Pradesh Agricultural University and Mr. P.S. Rao, Chief Conservator of Forests, Andhra Pradesh, on behalf of the Indian Organizing Committee for the Consultation.

3. In his opening statement, Dr. D. Bap Reddy stressed that conservation can be achieved only with the willing co–operation of rural people. This can be assured by ensuring that the welfare of rural people remains the central theme of the conservation policy.

4. Dr. Reddy underlined that conservation implies not only preservation and protection of a species, but also its sustenance and wise utilization.

5. He also emphasized that the objectives of wildlife conservation and its utilization for rural poor can and should be seen as mutually reinforcing and complementary.

6. He advocated the creation of buffer zones in forest areas where the accent should be on production of animal protein for rural people.

7. "Game viewing" as well as the "game cropping" are important economic activities in the utilization of wildlife resources.

8. After discussing the conceptual basis, Dr. Reddy said: "It is my firm belief that it is the degree of execution of planned policies and programmes which often separates the 'developing' from the 'developed'. There is no substitute for proper implementation."

9. Mr. P.S. Rao, Chief Conservator of Forests, Andhra Pradesh Government, welcomed the delegates on behalf of the Government of India and Government of Andhra Pradesh. He outlined the activities of Andhra Pradesh State Forest Department in the field of Wildlife Conservation and National Park Management. He emphasized that the ultimate goal should be one in which conservation should become a "way of life" and all development should be achieved without destruction of the environment.

10. Mr. J. Ragotham Reddy, Vice–Chancellor of Andhra Pradesh Agricultural University, extended a hearty welcome to the delegates; he highlighted the linkage between the Agriculture and the Forest/Wildlife sectors, a recognition of which has resulted in the creation of a faculty on farm forestry in Andhra Pradesh Agricultural University.

11. The Consultation was opened by Dr. M. Channa Reddy, Chief Minister of Andhra Pradesh State. In his address, he stressed the necessity to understand the critical role played by wildlife in safeguarding the inherent balance of nature of the animals or their usefulness to humanity. There are various ways in which these animals serve mankind, besides contributing to the wholesomeness and beauty of man's environment. He stressed that the Government of Andhra Pradesh is fully aware of the need for conserving wildlife and has been in the forefront of executing several projects concerned with wildlife conservation.

12. Mr. M.M. Hashim, Minister for Home and Forests, Government of Andhra Pradesh, in his Presidential remarks said that during the course of this century India has witnessed a gradual depletion of wildlife which is due to many factors: a rapid increase in human population: acute pressure on land and forests: growing urbanization and industrialization; and shooting of animals for pleasure. He called for efforts to conserve wildlife with wisdom and foresight.

13. Mr. A. K. Mathur, Liaison Officer of the Consultation, proposed the vote of thanks.

14. Mr. P.S. Rao, Chief Conservator of Forests of Andhra Pradesh, was unanimously elected as Chairman of the Consultation. Mr. Pushp Kumar, Conservator of Forests (Wildlife), Andhra Pradesh, was elected as the General Rapporteur of the Consultation.

15. The Consultation adopted the agenda (Appendix II).

16. For the technical sessions of the Consultation, the following Chairmen were elected:

a) Wildlife and Improvement of Quality of Life
   Mr. Qingru (People's Republic of China)
b) Wildlife Resources and Environment
   Mr. B.R. Koppikar (India)
c) Wildlife Resources as Food
   Mr. Effendy Sumardja (Indonesia)
d) Economics of Wildlife Resources
   Mr. Thongleua Southavilay (Lao) and
   Mr. Phairoj Suvannakorn (Thailand)
e) Wildlife and Medicine
   Mr. N.M. Maskey (Nepal)

f) Regional Co–operation in the Development of Wildlife

Mr. M.N. Raga (Papua New Guinea)

## Special Papers

17. The following special papers received an invitation and were presented at the Consultation:

a) *"Environmental Quality and Wildlife Resources"* by Mr. J.C. Daniel

b) *"Wildlife Resources and Environment"* by Mr. Zafar Futehali

c) *"Wildlife Resources as Food"* by Mr. Madhav Gadgil

d) *"Economics of Wildlife Resources"* by Mr. Shankar Ranganathan

## Field Visits

18. Field trips to Nehru Zoological Park, Vanasthali Deer Reserve and Nagarjana Sri Sailam Sanctuary were organized.

## Souvenir

19. A souvenir was issued to commemorate the occasion. The souvenir contained messages from the President of India, Prime Minister of India and several others, in addition to some articles.

## Photo Exhibition

20. An interesting photo exhibition by private individuals on the subject of wildlife was given.

# GENERAL SESSION

21. During the general session immediately following the inauguration of the Consultation, the FAO background paper, prepared by Dr. Boonsong Lekagul, FAO Consultant, on the subject of *"Wildlife and National Parks Management in the Asia and Pacific Region"* was summarized by Dr. Y.S. Rao, Regional Forestry Economist, FAO Regional Office, Bangkok, in the absence of Dr. Boonsong Lekagul due to unavoidable reasons.

22. There are at least 300 endangered species in the Region, of which there are 25 Marsupials/Monotremes, 114 Carnivores, 10 Small Mammals, 30 Primates, 121 Ungulates. The number of endangered species in each country is roughly proportional to the size and ecological diversity of the country. The great majority of the Region's large grazing animals are included in the list. The only exceptions being, sambar *(Cervus unicolor)* and barking deer *(Muntiacus muntjak)*. A review of endangered habitats is also provided.

23. Reviewing the current status of existing legislation, it is observed that enough legislation exists; it is the law enforcement which is inadequate and this can be a major constraint in improving wildlife management.

24. Since many of the management problems have an international component, international legislation has attained increasing importance. There are four main international conventions, the *Wetlands Convention;* the *World Heritage Convention;* the *Convention on International Trade in Endangered Species of Flora and Fauna* (CITES); and the *Migratory Species Convention.*

25. The report also discussed the training facilities and activities in the Region with special reference to four Training Institutions; namely (1) The Environmental Conservation Management Training School in Ciawi, Indonesia; (2) The International Seminar on Administration of National Parks and Equivalent Reserves, Canada, United States and Mexico; (3) The SEAMEO Regional Center for Tropical Biology (BIOTROP), Bogor, Indonesia; (4) The Man and the Biosphere Programme (MAB), launched by UNESCO in 1970, which includes 14 project areas.

26. While discussing the various aspects of *Wildlife for Rural Community Development,* The document stresses that management for *production* should be *outside* of national parks and reserves and the National Parks and Reserves should be managed for non–consumptive benefits.

27. Wildlife farming and wildlife tourism should be seen as viable only as a part of a package which includes the primary objective of conserving the resource base. The concept of buffer zones managed for the benefit of local people is useful. The problems in initiating, organizing and maintaining wildlife farms can be several and differ from one area to another. For example there may be some countries where the required land area which may be large, is simply not available. The economics of wildlife farming may change with the passage of time when more people take up farming and supply exceeds demand. The farm may be used by some as a cover for illegal hunting activities. The conventions that have been created to regulate trade among nations could eventually become a bottle–neck for marketing the produce from these farms. The upkeep of farms and continuously taking care of the health of animals, breeding and marketing may require considerable expertise and

resources. The quantum of financial and other resources required to establish economically viable farms could become prohibitive. Several aspects have to be studied case by case before decisions on wildlife farming could be taken. Some of the potential wildlife species suitable for farming are Monkeys (Rhesus), Sea Turtles; Elephants and Pheasants. Wildlife farming may have to be subsidized initially until they become economically viable operations.

### Discussion

28. In the discussion that followed, it was urged that wildlife should also include plants and the habitat of the wild animals and that there should be an ecosystem approach covering all aspects of the environment.

## COUNTRY STATEMENTS

### People's Republic of China

29. The delegate from the People's Republic of China said that there are more than 3,700 species of vertebrates in the People's Republic of China including 1,165 species of Aves, 428 species of Beasts, 299 species of Reptiles and 308 species of Amphibia.

30. The following legislations exist in the country in order to conserve Wildlife Resources:

a) "Regulations for the Protection of Forests".
b) "Regulations for the Propagation and Conservation of Aquatic Products".
c) "Directions on the Conservation and Rational Utilization of Wildlife Resources"
d) "The Forest Act of the People's Republic of China" (for trial use).
e) "Environmental Protection Act of the People's Republic of China"(for trial use).
f) "Regulations for Steppe Administration".
g) "Regulations for Wildlife Resources Administration".
h) "Regulations for Natural Reserves".

31. The conserved wild animals were divided into three categories:

a) Some forty species and sub–species such as Giant panda, Golden monkey, Takin, Wild elephant, Wild camel, Sika deer, Tiger, Red–crowned crane, Brown eared pheasant and Chinese alligator, etc., whose hunting is strictly prohibited or if they must be hunted for special need, it must be approved by the Ministry of Forestry.

b) Some sixty species and sub–species such as Great white crane, Whooper swan, Lesser panda, Tibetan antelope, Reindeer and *Megalobatrachus davidianus,* etc., whose hunting is prohibited. If it is necessary to hunt them, it must be approved by the provincial, municipal or regional department of forestry and must be reported to the Ministry of Forestry.

c) Nearly fifty species and sub–species such as Black stork, Sable, Golden cat and Musk deer. Hunting of these species is either prohibited or is strictly controlled and the annual hunting quota is determined by the provincial, municipal or regional department of forestry.

32. The country has established 64 natural reserves covering a total area of more than 1.7 million hectares (0.17% of the land area in China).

33. There are also special natural reserves such as the waterfowl reserve at Niao Dao Island, Chinghai Province and the snake reserve at Shedao Island, Liaoning Province.

34. The state bans felling, hunting, land reclamation, construction and other human activities in the reserves.

35. Several surveys on the composition of species and their distribution have been carried out in recent years. During these inventories, even new animal species were discovered: White–headed leaf monkey, Szechuan sika deer, etc.

36. Propaganda and education of various forms were undertaken to enable the cadres and the rural people to be aware of the importance of conservation and rational utilization of wildlife resources.

37. Regarding the raising and propagation of wild animals, at present, all the provinces and regions in China have deer farms. More than two hundred thousand deer are raised for young horns and other products.

38. There are seventeen species of deer family

animals of which Musk deer, Sika deer, Reindeer, Red deer, Sambar and White–lipped deer are being raised in great numbers. Mink and Musk rat have been introduced from abroad and are artificially raised for furs.

39. The state allows the commune members to raise Musk deer and other deer in captivity; the products, however, are sold to the state.

40. Initially, the state provided the breeding stocks but in recent years commune brigades are raising Mink without state aid.

41. The raising and propagation of wild animals have played an important role in rural development by providing increased incomes and by strengthening the collective economy. Such incomes are used by the communes for buying machines (tractors, diesel engines and electric motors), construction of houses, live–stock sheds and ships, etc. This illustrates how the raising of animals can lead to the development of agriculture. Thus, implementing a policy of "supporting agriculture with subsidiary occupations" and "simultaneous development of agriculture and subsidiary occupations" is consciously implemented in China.

## India

42. The delegate from India presenting the status paper for India, said that following the recommendations of an expert committee the Government imposed a total ban on killing of Tiger from July 1971.

43. The Wild Life Protection Act, 1972, provides for stringent punishment for wildlife offences. Decreasing forest area is cited as a major reason for depletion of wildlife resources in India. Some 4 million hectares of land were lost to forestry during the last 25 years. Other factors responsible are poaching, liberal issue of crop protection guns, use of pesticides, lucrative prices for skins of tiger and other animals in foreign markets, etc.

44. India has 19 national parks and 203 sanctuaries covering a total area of 75,763 sq. km., which is about 10% of the total forest area in India.

45. A special project for protecting Tiger is being implemented in 11 areas in 10 states. The latest count shows there are 2,278 Tigers in 1977 as against 1,827 in 1972.

## Indonesia

46. The delegate from Indonesia presented the country status paper for Indonesia. He reported that Indonesia's forests contain roughly 25,000 species of plants, 500 species of mammals, 1,500 species of birds, and perhaps a million other vertebrates and invertebrates. It is the policy of the Indonesian government that no species will knowingly become extinct in the country.

47. Development which is based on natural ecosystems appears to be the appropriate way for rural communities to improve their standard of living while serving the environment. Some areas in which Indonesia suggested FAO action are:

a) Research and conservation of genetic diversity and support to creation of genetic reserves.

b) Buffer zone development should receive special attention, both at the conceptual level and in a few pilot projects in areas such the Gunung Leuser National Park.

c) Training programmes for guards, including provision of appropriate materials.

d) Crocodile management, as in Papua New Guinea, should be attempted elsewhere as well.

e) Deer farming needs more attention, but development should proceed at an orderly pace so that markets can also be developed to keep pace with increased supply.

f) A pilot project on Primate utilization in a habitat country might be worthwhile, provided that endangered species are not considered for such a project; *Macaca mulatta, M. fascicularis,* and perhaps a few others would be sufficient for the purpose.

g) Ways and means of modernizing elephant management techniques should be sought. Indonesia needs expert help in elephant management in Sumatra.

h) A Regional School of National Parks and Wildlife Management should be considered a high priority, Indonesia already has the basis of such a school and has offered to make this into an expanded regional school. FAO support for this would be welcome.

## Lao P.D.R.

48. The representative from Lao P.D.R. gave a brief account of the forest and wildlife situation in Lao in French, which was translated by Dr. Sale.

49. Lao has an area of over 293,000 sq. km. During a long history of war, large areas of the forest and its wildlife were badly destroyed until Lao became independent in 1975.

50. The total forest area of the country extends over 90 million hectares and accounts for 90% of the land area. Of this, 1 million hectares are degraded forests, 2 million ha. are dense forests, 2–2½ million ha. are mixed deciduous forests and ½ million ha. are Pine forests.

51. Regarding wildlife, there are 200 species of mammals (including Elephant, Tiger, Kouprey and Deer), 500 species of birds and 200 species of reptiles. During the wars, most of this wildlife was destroyed and some reptiles migrated to other countries. Since independence, wildlife has been returning to the country. Rhino, which had become almost extinct in

the country, has been reported in some areas.

52. The government is struggling to educate the rural masses in the importance of wildlife. Legislation has been enacted since 1975 to protect forests and wildlife and the hunting of Tiger, Elephant, Kouprey and other endangered animals is prohibited.

53. The few forest reserves exist mainly to protect water sheds. There are no national parks or sanctuaries as yet, although there are many suitable areas which could be considered.

## Nepal

54. The delegate from Nepal, presenting the country status paper for Nepal, briefly reviewed the forest resource situation in the country and said that the Tropical Deciduous Monsoon forests of Nepal constitute the habitat for guar, buffalo, four species of deer, tiger, leopard, rhinoceros, swamp deer and hog deer. Two species of crocodile and the Gangetic dolphin are also present.

55. In the Sub–tropical Mixed Evergreen Forest, wild boar, barking deer, serow, goral and bear, together with varieties of birds, are found.

56. In the Temperate Evergreen Forest (altitudes of 2,400 m. and above), Himalayan tahr and red panda occur. The avifauna includes several spectacularly beautiful pheasants; amongst which is the Danfe pheasant, Nepal's "National Bird".

57. In the Sub–alpine and Alpine Zone (above 5,000 m. altitude) mammalian fauna is sparse and unlikely to include any species other than Himalayan marmot, mouse hare, tahr, musk deer, snow leopard and an occasional blue sheep, though in former times the wild yak and great Tibetan sheep occurred north of the main Himalayan divide. The bird life at these altitudes includes such species as the Lammergeyer snowcock, snowpartridge, choughs and buntings, with redstarts and dippers often much in evidence along the streams.

58. In order to effectively conserve the wildlife resource His Majesty's Government of Nepal initiated a National Park and Wildlife Conservation Project in collaboration with FAO/UNDP in 1973, which assisted in establishing National Parks and Reserves. At present Nepal has four National Parks (Chitawan in Terai; Langtang, Mt. Everest and Rara in mountains) and three Wildlife Reserves (all in Terai) in representative areas of various ecosystems. Nepal is currently concentrating its efforts in the field of conservation of wildlife and the environment. This is the country's first priority. Utilization of wildlife resources will attract attention only at a later stage. Breeding of Black buck (Karnali Wildlife Reserve) and a nursery for Gharial (Royal Chitawan National Park) are two interesting wildlife schemes in Nepal.

## Papua New Guinea

59. The delegate from Papua New Guinea, presenting the country status paper on Papua New Guinea, said that almost 90% of the landmass is covered with rain forests and the rest is savannah woodland (drier areas near Port Moresby and the Western province). There is a wide variety of fauna and flora largely attributable to the varied topographic and climatic conditions.

60. Among the animals found in Papua New Guinea are five species of Kangaroos along with spiny ant eaters, rats, mice and bats. The bird life in the country is very rich; some 300 genera and 650 species are represented. In addition, tortoises, turtles, dugongs and reptiles are among the important forms of wildlife in the country.

61. There is a Ministry which is solely responsible for the conservation of wildlife resources and environment. The principal laws that have been enacted are: (i) Fauna (Protection and Control) Act, (ii) Crocodile Trade (Protection) Act.

62. In Papua New Guinea the following species have been declared as national animals and protected species: a) All Birds of Paradise, Riflebirds and Bowerbirds; b) Three species of Egrets (the large white, the little snowy and plumed); c) All Goura pigeons; d) The New Guinea eagle; e) All Ospreys; f) Salvadore's teal; g) Seven species of Birdwing butterflies; g) Brown and Rainbow trout less than eight inches long; i) Boelen's python; j) Long–snouted echidna; k) Dugong.

63. One of the major wildlife programmes of Papua New Guinea is the crocodile conservation and management programme which trains rural people to rear crocodiles caught by them in the wild.

64. Some areas designated as *Wildlife Management Areas* are run by committees of people with traditional land rights to the areas. Each committee is chosen by the people and it decides on rules for looking after the area. These rules are made into law only when they have the support of all the people and are endorsed by the National Government. *Wildlife Management Areas* are not against development; they help in the wise utilization of the resources of the area.

65. Since the creation of the programme in 1974, the number of *Wildlife Management Areas* has increased to ninety. The largest is in the Maze area in the Western Province of Papua New Guinea. It covers a total of about 184,230 hectares, much of which is in the sea. The animals protected in the areas include dugongs, marine turtles and the reefs. Only the traditional landowners have access to the area. Any other person must first obtain permission from the commit-

tee.

66. The most significant aspect of the programme is that the government is working with the people, and at the same time letting the people help themselves by conserving the natural resources on their land.

67. The Insect Farming and Trading project was started by the government in 1977 with two primary objectives: a) to assist interested villagers in collecting and farming butterflies and insects; b) to establish export market systems.

68. More than 500 farmers and collectors have gone into insect farming and trading. To help them, the government has set up a marketing center which purchases the insects and butterflies from the rural people and sells them to overseas dealers.

69. Trading in the plumes of the Birds of paradise is causing a depletion of this species. To halt this trend, Wildlife Management Areas have been set up for these birds and in these areas the use of weapons, other than the traditional ones, is prohibited and no exchange of money should be involved.

70. The cassowary is hunted for food and feathers. It is hard to find and obtain and therefore considered very valuable. The government has set up a conservation and management scheme with the co–operation of the landowners. This includes applying restrictions to traders and improving the financial gains to producers and suppliers. The restrictions are designed primarily for the conservation of the species as well as protecting the cassowary industry.

71. A project for deer farming is currently in its initial stages and involves studies and extension work concerning wild populations. The main herds are found on the Tonda Wildlife Management Area which covers some 2,000 sq. mi. The deer provide the only source of income for the people who live in the Tonda area. The government has set up a programme to look into deer farming and harvesting on a large scale. The benefits from the project will go to the village people who own the land.

72. Two projects on Dugong and Turtle conservation and management are in the initial stages of development. Both dugong and turtle are important to the coastal people of Papua New Guinea. They are hunted traditionally for food; the people also earn cash income from sale of dugong and turtle meat and shells at local markets.

73. The major objective of these projects is to evolve conservation and management strategies which will be beneficial to the people and consistent with their traditional practices and beliefs.

## Thailand

74. The delegate from Thailand introduced the country status paper for Thailand and said that due to uncontrolled hunting in the past and the destruction of forests for farming, some large mammals such as Eld's deer, wild Buffalo and the Rhino have become seriously endangered. The extinction of the Schomburg deer some fifty years ago can be cited as a good example of over–hunting and destruction of an animal's habitat.

75. The following legislation exists in the Country: a) The Wild Elephants Act, 1921; b) The Wild Animals Reservation and Protection Act, 1960.

76. The Wild Elephant Act is limited in its scope and provides protection only to wild elephants. The Wild Animals Reservation and Protection Act of 1960 prescribes two main groups of wild animals for reservation and protection. The first group is the "Reserved Wild Animals" which consists of nine species. The second group is the "Wild Protected Animals". This group is further sub–divided into two categories. The first category contains the wild animals which are not considered as game animals and whose flesh or meat is not normally used as food. There are 174 species, of which 39 are mammals, 135 are birds and 6 are reptiles and amphibians. The second category of wild protected animals are those considered as game animals and whose meat is normally used as food. There are 31 species (11 mammals and 20 birds).

77. Trading and possession of the reserved group of animals are absolutely prohibited. In the case of protected animals, licenses are required.

78. Thailand's first wildlife sanctuary was established at Salakphra, Kanchanaburi province in 1965. At present, there are 21 wildlife sanctuaries throughout the country. In addition, there are also 14 non–hunting areas. Hunting of certain species of wild protected animals in the non–hunting areas is prohibited.

79. A wildlife propagation centre has been set up at Bangphra, Cholburi province. It started with a few pairs of the rare Siamese Fireback Pheasant *(Lophura diardi)*. Later on more species of pheasant, both local and exotic, were added to the programme. Some species show a promising future of breeding in captivity.

80. Of the large mammals, deer species were tried in some Nature and Wildlife Education Centers. Pairs of Sambar deer *(Cervus unicolor)* and Hog deer *(Axis porcinus)* were put in a very big, natural enclosure. There was successful captive breeding. Some of the new born have been released into the wild. More work of this nature will be undertaken in the future.

81. In order to assist the efforts of the private sector in the field of wildlife conservation, the Board of Wild Life Committee (the highest policy making body on these matters) has decided to allow trade in wildlife species propagated by the private sector.

## WILDLIFE AND IMPROVEMENT OF QUALITY OF LIFE

82. *Mr. J.C. Daniel* of the Bombay Natural History Society, presented the position paper on the subject titled **"Environmental Quality and Wildlife Resources"** He said that from the time man became an agriculturalist and husbandman, thereby enabling himself to overcome the natural constraints that had kept the numbers of his predecessor in check, man's impact on his environment has been largely disastrous. The sorry process of destruction of the environmental quality, and with that the quality of life, continues today; improvements in communications and technology now permit man to exercise his expertise as a creator of deserts on a global scale and at an accelerated tempo. A study of any endangered natural resource and its effect on environmental quality invariably shows that the basic problem in every case is the ever–increasing human population leading to a constant erosion of that resource. He gave examples of the loss in the productivity of the land and the consequent loss of environmental quality. He advocated that in order to prevent or at least ameliorate the dehumanising effects of the present day industrialised civilization, man should ensure that wildlife and wilderness exist within a reasonable distance of major centers of urbanization. He cited the Mahim mangrove and bird sanctuary in the heart of Bombay City, the Borioli Natural Park within Bombay's Municipal limits, the Guindy Park in Madras and the ridge in Delhi as good examples which need to be emulated. He finally made a plea for the creation of groves of trees and forests of "peace" for each community to improve their quality of life.

83. A paper on this topic authored by Messrs *M.N. Raga and I.I. Ila* of Papua New Guinea was presented by Mr. Raga. In this paper the authors basically reviewed how wildlife management in Papua New Guinea is geared to improvement of the quality of life of rural people. Examples of such projects as crocodile management, insect farming and trading, management of Birds of Paradise, deer farming and management of Dugong and Turtle in Papua New Guinea have already been summarised under the country status paper.

84. *Mr. K.K. Mahajan* of the Botanical Survey of India, presenting a paper on renewable natural resources and quality of life, stated that the prosperity of a nation is very much correlated with her existing and potential natural resources. It has been said that the lack of proper understanding and evaluation of natural resource may be a serious deterrent to economic growth and the increased welfare of the people in developing countries. History of the recent past, however, reveals that there has been a mass awakening and development of a sense of adventure, initiative and desire for improved living conditions through modern methods of survey and assessment of the natural resources and the development of optimum methods of their exploitation. He pointed out how proper knowledge and the judicious use of natural resources can play an active part in raising the living standards of the masses and also help the national economic growth.

85. Speaking on wildlife resources and improvement of quality of life, *Mr. Liang Chonggi* of the People's Republic of China said that if there are enough birds, squirrels, frogs, insects, cicadas crickets, etc., they will add liveliness to the urban environment and make people feel relaxed. In ancient China, many kinds of game were listed on famous menus. Today hazel grouse, quails, deer meat and soft shell turtles are still considered as delicious and nourishing food. China has an age–long tradition of research on and utilization of medicines derived from animals. There are over 100 kinds of Chinese medicines containing deer products. For example, pilose antler can be used to cure neurasthenia and heart diseases. Currently some research centres in China are only concerned with discovering and raising new animals to serve as experimental material in biological and medical research. Such work is necessary to conquer diseases and improve the health of mankind. Fur coats and leathers in China play an important role in offering protection against cold. Both production of fur and research into development of better products is engaging the attention of Chinese people. They have already succeeded in introducing minks and musk rats on a wide scale into the country. People have gained economic benefits both in direct usage and in exchanges because of this activity. In the field of perfumes, musk deer, musk cat, sperm whale, musk beaver are the four main species of animals from which perfumes and perfume fixatives are manufactured in China. China also realises that wild animals are of value in the fields of aesthetics, education, economy and ecology. Giant pandas are serving as a token of friendship between the peoples of China and other countries.

86. In his paper "A Rural Reminiscence" *Mr. Saroj Raj Choudhury* stated that before the Second World War, despite seemingly heavy cropping, there was no evidence of depletion of wildlife in Indian villages because game cropping was practised with wisdom for the benefit of the local people only and for food. Since the war, hunting with jeeps and automatic weapons, and with a callous disregard for the ecosystem, resulted in the depletion of wildlife and the despoiling of the habitat at a rapid rate. The speaker also

said that the turnover potential of animals far exceeds that of trees. A seedling has to grow for many years to become a mature tree; on the other hand, a fawn becomes an adult in 2 years. He gave statistics of productivity of some wild animal species. He pleaded that conservation efforts will have no lasting success unless local people participate and secure material benefits in the process of conservation.

## Discussion

87. The discussion mainly centered round the paper presented by the Papua New Guinea delegation.

88. During the discussion further information was elicited from the delegation of Papua New Guinea on the legal mechanism which enabled the country to succeed in enriching the quality of rural life through management of wildlife. The delegate from Papua New Guinea replied that wildlife management areas in Papua New Guinea are totally controlled by the people who own the land. Any trespasser found committing an offence within a wildlife management area is reported to the Law Enforcement Ranger who undertakes investigations and subsequently takes the offender to court.

89. Any proposal to log timber, establish resettlement schemes, etc. is normally brought to the people by the governmental department concerned. Negotiations then take place. If the landowners feel that the project will not benefit them, they say so, otherwise they may consent to the operations with several conditions. The people can withdraw any contract upon breaching of contract by a government agency. Thus all operations have one central purpose–the benefit to the local community.

# WILDLIFE RESOURCES AND ENVIRONMENT

90. The position paper on the subject of **Wildlife Resources and Environment** was presented by *Mr. Zafar Futehali.* He pleaded that the term wildlife should include the entire uncultivated range of flora and fauna. Not only major mammals but the insects are also essential constituents of wildlife. Insects produce germs that help in breaking down and recycling the nutrients. However, an excess of insects can become pests and have to be regulated.

91. He emphasized the principle that diversity results in stability. This obviously meant that no species of wildlife should be allowed to multiply to the degree of becoming a pest. If any species tends to multiply beyond the acceptable level, there are two options for controlling its population. There are biological control and control by the use of synthetic chemicals. In the olden times only biological control was in evidence. But more recently to protect hybrid varieties raised in monoculture, prolific use of synthetic chemicals has been resorted to. Whereas India used only 3,750 m.t. of synthetic chemicals for pest control in 1952, currently it uses 77,420 mt. The use of these chemicals pollutes the environment and results in the decimation of several kinds of flora and fauna.

92. Mr. Futehali then emphasized the role of the bird population in controlling unwanted insects. Birds eat several times their own weight of insects everyday. With their high metabolic rate they absorb pollutants very fast. In India, a predominantly agricultural country, birds should be allowed to play a crucial role in controlling insect pests.

93. Birds proliferate where the environment is free of pollution. For example, the return of several species of birds is a marked feature of the cleaning up process of London.

94. The speaker finally argued that dealing with fragments of the environment as is now done in India is a short–sighted policy. Since the eco–system spans the entire country, what happens to one species in one area affects the landscape as a whole. Therefore, he stressed the need for evolving a comprehensive plan for managing the land and water resources of the country viewing them in their totality. In such a scheme there will be a place for wildlife farming as well. Wild animals are light on the land and even semi –arid regions can support huge populations of wild animals. In Utah State (USA) which is about 1/14th the size of India, more than half the land is kept under pasture to raise over a million and half game animals. In some national parks of Africa, studies show that the biomass of wildlife is much higher than that of cattle. In the Kagera National Park of Rwanda, which is an *Acacia* woodland, the biomass of wild animals is 18,670 kg. per sq. km. The total dressed weight of these animals is over 12 million pounds. Thus, with proper planning, enormous quantities of protein can be produced through wise land use

planning.

**95.** *Mr. S.M. Ali* in his paper "Wildlife and the Western Ghats" focussed attention on the uniqueness of the Silent Valley ecosystem and highlighted the dangers of human intervention through the construction of hydro–electric projects in such areas. He emphasized the unparalleled nature of the tropical rain forest here and its variety of wild fauna. He pleaded for the preservation of Silent Valley in its pristine form.

**96.** *Mr. Zhao Quingru* presenting a paper of "The Close Relationship Between Wildlife and Environment" stated that a swallow can exterminate more than 1,600 insect pests every day; more than 1/2 million to one million flies, mosquitoes and aphides in one summer. A group of Rose–colored starlings in one month of their nest–building period can exterminate one hundred tons of locusts. An owl can devour one thousand common field mice in one summer and thus save one ton of grain from damage by mice.

**97.** Australia introduced the Chinese dung beetle onto the steppe to destroy the hard lumps of ox droppings and improve growth of forage. Manatee, a large aquatic mammal can be used to destroy water hyacinth and thus clear irrigation canals from this pest.

**98.** The above examples indicate that the environment for human existence is a huge ecosystem and wildlife is one of the important elements maintaining and co–ordinating the balance of this ecosystem. People's Republic of China established wildlife and natural reserves to ensure an appropriate environment for the propagation and growth of wild animals: Niaodao water fowl reserve in Chianghai Province; Shedao snake reserve in Liaoning Province; a natural reserve for the famous Red–crowned crane covering 40,000 ha. of reedy swamp in Heilungkiang Province.

**99.** Giant Panda and Lesser Panda are valuable animals in China, and thirteen natural reserves covering a total area of 400,000 ha. have been established in their major habitats in Szechuan Province. Felling and hunting are banned in these reserves to conserve the natural ecosystem. Scientists intend to promote mixed bamboo forests in the habitats of Panda to provide alternative food for them.

**100.** However, there are also several instances of destruction of forests for land reclamation and indiscriminate hunting in some regions resulting in the depletion and sometimes extinction of such species as Pere David's Deer (mi–lu), Tarpan, Saiga, White–hipped monkey, Hog deer and some species of Pheasant. Some rare animals such as Gibbon, Hainan deer, wild elephant, Tiger, White–finned dolphin, Dugong, Crested Ibis, Black–necked Crane, and Chinese alligator are on an endangered species list.

**101.** Due to indiscriminate fishing, filling up of lakes, blocking of rivers and construction of dams as well as industrial water pollution, the output of fresh water fish, which was 600,000 tons in the 1950s, was reduced to 400,000 tons in the 1960s, and 300,000 tons in the 1970s, and the fall in production continues today. Apart from the reduction of fishing output, there has been a reduction of fish species as well.

**102.** The Lessons to be drawn from the past are:

a) Wild animals and the environment constitute an interlocked system which enables the mutual exchange of materials and energy. This is the essence of the ecosystem.

b) Broad– based and persistent propaganda and education must be carried out to arouse the whole population, especially the rural people and the people in the forest regions, to an awareness of the close relationship between wild animals and the natural environment as well as the important role that wild animals play in maintaining the ecological balance.

c) Although the direct conservation of wild animals is important, conservation of the habitats of wild animals is more important. Therefore, forest and grassland should be effectively protected and rationally exploited. Selective felling, thinning and strip felling are helpful to the conservation of wild animals.

d) It is necessary to have classes of zoology and environmental protection starting in primary schools and continuing through colleges and universities of agriculture and forestry to give students a systematic education from their childhood.

e) Wildlife reserves should be energetically established as an effective means to conserve wild animals especially the endangered, valuable and rare animals and their habitats.

f) Raising farms of Deer, Musk deer, Mink, Sable, Hare, Whale and Turtle are beneficial both for the conservation and propagation of wild animals as well as to increase incomes.

g) Scientific research should be strengthened.

h) Legislation should be improved and enforced conscientiously and effectively. Violators should be punished and those who performed meritorious services should be rewarded.

i) Powerful special administrative organizations should be established and unified and a concentrated administration of conservation

and utilization of wild animals should be constituted.

j) Exchange of information and techniques should be improved. Professional meetings or seminars like this Consultation should be held every two or three years to discuss problems and exchange experiences.

**103.** *Mr. Pong Leng–EE of Thailand* presented the paper "Present Status of Wildlife and National Parks in Thailand". He informed the Consultation that the national policy is to have about 10 percent of the forest area under National Parks and another 10 percent under wildlife sanctuaries. So far the area under Santuaries has achieved the 10 percent level but the area under National Parks is only 2.5 percent. There are 36 existing National Parks including 3 Marine National Parks.

**104.** Thailand has a National Park Act, passed in 1961, and the first National Park was created in 1962. Thailand also has 43 Forest Parks and there are proposals for the creation of some City Parks near large cities like Bangkok for the people's recreation.

**105.** The National Parks are under Park Wardens who have had in–service training in Park Management. There is evidence of overuse of the National Parks by visitors and this is sought to be relieved by exercising controls and by creating more National Parks.

## Discussion

**106.** During the discussion it was pointed out that when introducing any new species into an environment, great caution should be exercised. The introduction of Chital and the Giant Snail in the Andamans were cited as examples. In the absence of predators, Chital multiplied enormously and became a pest to the crops and to the forest regeneration to the extent that rewards were offered for their destruction. The population was brought under control by encouraging hunting of deer as a source of wild meat. Similarly the introduction of the Giant Snail has proved disastrous in as much as their population has tremendously multiplied and caused large scale destruction of the crops.

**107.** The question was raised whether the protein diet from wild animals in Uganda was obtained from National Parks or from other areas. One delegate expressed apprehension about such ideas as wildlife farming in India since it may have adverse implications in protecting the wildlife in National Parks and Sanctuaries. It was answered that the idea was to harness for this purpose, the 94 million hectares of land at present lying unutilized in India.

**108.** The point was brought up that the ecological balance is not static and is constantly changing, and that the environment may change faster than man's ability to adapt himself to these changes. By environment was meant what particular flora and fauna could thrive under a particular set of situations and planners in the country should be aware of environmental limitations before making any interventions.

**109.** Experiences in National Park Management in Thailand were said to have indicated that:

a) There should be no exploitation of forests, whether in a National Park or Sanctuary, for conservation to be successful.

b) A buffer zone around conservation areas is essential so as to insulate the areas from extraneous human pressures. Khao Yai National Park in Thailand is a case in point; if one were to look at the aerial photograph of the area the only dark patch having vegetation is co–terminous with the boundaries of the National Park.

c) The only way to protect the nature areas was to give them a special conservation status such as a National Park or Sanctuary.

**110.** At the same time it was pointed out that sometimes the plants can survive only with the help of the animals. Out of 472 tree species in the rain forest of Thailand, 471 are pollinated by insects. If the primary forest was destroyed these insects would of course be destroyed too and the secondary forests would not carry the original complex of species; in the absence of these insects there would be failure of reproduction of tree species.

**111.** It was suggested that we ought to keep the environment in the most advantageous stage of succession. In other words if a secondary stage was more advantageous, rational management should aim at perpetuation of such a secondary stage of wildlife environment. This theory was illustrated by the example of Nagaland, where the primary forests were replaced by secondary forests. The secondary forests supported a greater status of wildlife because of better fodder productivity as compared to the primary forests.

**112.** The question was asked as to which successional stage was considered to be the most advantageous since National Parks and Sanctuaries usually had set objectives and these generally sought to exclude or minimise the human use. In answer, Bharatpur Sanctuary in Rajasthan was given as an example. Traditionally the bulk of Bharatpur lake was drained after winter and most of its area remained dry until the next monsoon. Once it was decided to keep the whole area permanently under water, most of the existing trees started to die. This seriously undermined the habitat of the resident nesting birds. This mistake was corrected and the old practice of keeping the area dry over half of the year has been reinstated. Thus

maintaining the area in such a stage proved more advantageous and this was what was meant by maintaining the environment at a particular seral stage.

**113.** At this point it was observed that National Parks and Sanctuaries must be viewed apart from the general forest areas. This is because National Parks and Sanctuaries are constituted with specific objectives such as preservation of endangered species or the preservation of a typical complex of species in a particular area. Management in such areas will have to conform to these specific objectives. The question was raised as to how are we going to manage the general forest areas that have to bear the pressure of the people's demand for timber and other forest produce as well as grazing. It is in these areas that the availability of wildlife resources could be considered in the context of rural development. It was suggested that this Consultation should address itself to the problems in these areas of harnessing them to the best advantage of the rural community for meeting their demands for wood, forest produce and animal products.

**114.** Attention was drawn to the marine resources in coastal areas of the country which are suffering serious change through industrial and commercial exploitation. The Gulf of Kutch, Gulf of Manner and the coral reefs of Andamans and Nicobars, Laccadives and the east coast, were cited as examples.

**115.** The Government of India recently constituted a special Committee for the preservation and development of coral reefs.

**116.** Marine National Parks have been proposed to be set up in the Gulf of Kutch and Manner which should help to cope with the situation.

**117.** It was said that the pressure of the demands of the rural population was constituting a grave problem in the Sanctuaries. The most adverse is the high grazing pressure which could not be eliminated for want of alternative pastures. Effective buffer zones were advocated as a necessity to keep such pressures away from the main conservation area.

**118.** A better ecosystem was defined in terms of the following characteristics:

a) Bio–mass should be high.
b) Material conversion and material circulation should be of high order.
c) The variety of wild fauna and wild flora should be abundant.
d) The ecosystem should be stable and amenable to adaptability.

**119.** The following suggestions were made:

a) FAO should continue and expand its support for the establishment and improvement of the National Parks and other protected areas, particularly in the tropical countries.
b) Buffer zones should be recommended for creation around the National Parks and other protected areas for meeting the daily needs of local villages (fuel, coals, wood and other forest products).
c) A balanced programme of conservation and management of wildlife resources must include effective conservation of natural habitats/environment, where they can be subject to the normal processes of natural selection.
d) In all areas of logging concessions at least 1 to 2 percent of the area should be set aside as a Sanctuary area for the refuge of flora and fauna.

## WILDLIFE RESOURCES AS FOOD

**120.** *Prof. Madhav Gadgil* of the Centre for Theoretical Studies, Indian Institute of Science, Bangalore, presenting the position paper **"Wildlife Resources as Food"**, said that although at one time it was believed that the hunting–gathering existence was precarious and uncertain, with people incessantly toiling just to keep themselves from starvation, the work on the hunter–gatherers of the Kalahari desert of South Africa has shown that the hunter–gatherers have at their disposal a reliable food supply and that their way of life provides abundant leisure time. It is likely that the hunting of wild animals and gathering of wild plants did and can provide a very satisfactory way of life.

**121.** The speaker then gave examples of how fish and shellfish, from both freshwater and the sea, can constitute an important source of food for those living near the coast or near an inland water resource. Until recently wild animals constituted an important source of food for those living in the hills and dry tracts of the Western Ghats of India. However, the series of dams built along the whole hill chain during the past 50 years resulted in the destruction of the habitat for

wildlife. Even so the Kunbi peasants, the local inhabitants, still look avidly for wild animals as a protein source to supplement their otherwise monotonous cereal diet. They report that where they used to get a deer or wild pig every week, now they barely get a blacknaped hare once a month.

122. The speaker than reviewed available research information in India on the hunting practices of the non–pastoral nomad tribes of Maharashtra. According to him the three communities i.e. Phaseparadhis, Vaidus and Nandivallas show interesting adaptations in their hunting practices. The Phaseparadhis specialize in the most preferred prey–the blackbuck–and have highly developed techniques for snaring them, using a cow as a cover. They also snare partridges, quails and a variety of other birds. In recent times, the rapid decline in their major prey– the blackbuck, has nearly destroyed their base of subsistence. The Vaidus specialize in the trapping of medium sized carnivores such as cats, civets and mongooses. Their speciality is the surreptitious trapping of domestic cats in the villages. The Nandivallas have a wide range of preferences but their speciality is the hunting of more dangerous animals such as wild pig and porcupine using dogs. Their other major prey species include the blacknaped hare, leopard cat, turtles,jackals, partridges and monitor lizard. They are the only group to hunt the palm squirrel.

123. There is relatively more extensive information on the hunting practices of the Nandivallas based on detailed interviews of 43 families. The median annual biomass of hunted animals is 2,180 kilogrammes per family. The Nandivallas are thorough in their utilization of the hunted animal and portions normally discarded by other communities, such as brain and viscera, are consumed by them. Hence almost two–thirds of the live weight of the prey is actually consumed by the people. In terms of per capita daily consumption, the median works out to 57 gm. of protein and 850 calories from hunted wild meat for the Nandivallas. The hunted meat therefore provides a more than adequate level of protein and over one–third of the calorific requirements to an average Nandivalla.

124. The speaker concluded that wild animals may still make a substantial contribution to the nutrition of certain communities in India.

125. Presenting a paper on "The Importance of Wildlife Foods in Rural Africa", *Dr. J.B. Sale,* FAO Expert on Wildlife Management, Hyderabad, India, briefly reviewed the literature on wild animals and plants and how they constitute a highly significant source of food in many contemporary African societies. Whatever the basic economy, there is frequent and widespread use of wild resources. The unsophisticated bushmen show a virtually total dependence on wildlife; while in many other economies it is a "famine food", which although only eaten seasonally is nevertheless vital to survival. In some of the heavily populated areas of Central and West Africa, wildlife foods, especially game meat, are preferred over domestic varieties and, indeed, are being consumed in such quantities as to threaten the conservation of the wildlife.

126. A certain amount of research is now being carried out on the possibility of "farming" favoured species at a village industry level, in order to ensure regularity of supply and relieve pressure on wild populations. It is a matter of debate as to whether or not this farming approach will make a greater contribution to rural development than well organized local hunting of wild populations, of the type carried out successfully in Botswana. It may well be that hunting can only be successful in areas of relatively low density, where there is still plenty of wilderness habitat for wild animals to maintain large populations.

127. Analyses of nutritional quality show that almost all wild plant and animal foods compare very favourably with their domestic counterparts. In many cases a superior nutritional value of wildlife has been proven. Hence wildlife foods are demonstrated to have made an actual, contribution to the quality of rural existence, particularly as they provide much needed protein, vitamins and minerals to people whose economic ability to purchase these vital dietary components in the marketplace is severely limited.

128. The promotion of wildlife foods is not only desirable from economic considerations, however. Perhaps more important is the fact that the judicious harvesting of wildlife products by rural people reflects a much sounder appreciation of man's ecological relationship to his environment than that of many of the contemporary market–oriented economic theories. Ultimately rural populations can only develop and progress if they are in a balanced relationship with their surroundings and this must include the wild flora and fauna.

129. *Mr. D.B. Deb* of the Botanical Survey of India, presenting a paper on "Edible Wild Plants of North East India", said that North–east India is one of the major centres of origin of cultivated plants, and is very rich in edible wild plants. This region is botanically underexplored and floristically inadequately studied. Over 250 species of seed bearing plants are used by local people as food. These need be quantitatively estimated, chemically analysed, scientifically established and nutritionally evaluated for pin pointing their scientific and economic potential, which in turn may be appropriately exploited for rural development.

130. *Mr. V.V. Ramana Rao,* Research Officer, Tribal Cultural Research and Training Institute, Hyderabad, India, presenting a paper on "Wild Plant and Animal

Resources in Tribal Diets" said that roots and tubers are the most important items of forest foods consumed by the tribals throughout the year. Their quantity varies from season to season. The Chenchus of the Nallamalai hills in Andhra Pradesh, India, consume three important varieties of wild roots. These three roots are the life saving foods for many households. Several varieties of *Dioscorea* species are collected throughout the tribal belt.

**131.** Innumerable varieties of leaves are collected and consumed by the tribes. *Amaranthus spinosus,* wild spinach, *Colocasia,* Pumpkin, Tender tamarind, Lotus, drumsticks, ficus leaves, etc., merit special mention. Bamboo shoots are sliced and cooked with cereals and eaten.

**132.** Apart from leafy vegetables the forest also provides some wild vegetables to the tribal diets. Wild brinjals, wild bettergourd, wild cucumber, ridge–gourd, wild beans, wood apple and green tamarind are the most important among them.

**133.** The tribals also consume some flowers, especially Mohua flower, flowers of Chironji, lotus, waterlily and tamarind.

**134.** Innumerable varieties of fruits are collected from the forests and eaten such as fruits of Zyzyphus, Mango, Chironji, Seetaphal, ficus, *Diospyros* and jack fruit.

**135.** Wild seeds and nuts are the important sources of vegetable protein for the tribals. Mango kernels are ground into powder and washed several times to remove bitterness and eaten. Jack fruit seeds are roasted or cooked and eaten.

**136.** Honey, mushrooms and several varieties of insects form part of the tribal diet.

**137.** Apart from the vegetable sources the forest also provides several varieties of birds and animals such as rabbits, Jungle cats, mongoose, squirrel, giant squirrel, Iguanas, Jungle fowl, partridges, sparrows and parrots which are generally hunted with bow and arrow. Big game like deer, spotted deer, sambar, Nilgai, wild bear, etc., are hunted by groups using snares, nooses, dead falls, pits, etc. The pools and streams in the jungles provide tribals with fish, crabs, and turtles, though in small quantities.

**138.** Tribal diets are generally deficient in calcium and fat.

**139.** Studies reveal that about 10 to 20 percent of the food intake of tribals is collected from the forest. In times of scarcity wild foods constitute as much as 90 percent of their diet.

**140.** *Mr. L.A.K. Singh* presenting the paper on "Role of Sea–Turtles in Rural Development" written by *C.S. Kar,* Orissa, said that out of the seven species of existing sea turtles, five have been reported from the east coast of the Indian peninsula. These are: Olive Ridley turtle, Leathery turtle, Loggerhead turtle, Hawksbill turtle and the Green turtle. Out of these, the Olive Ridley and the Green turtles are most severely hunted for their meat. Other turtle products used by the people are the Calipsee, Calipash, turtle shell and turtle eggs.

**141.** The Olive Ridley concentration along the coast of Orissa is regarded as one of the largest sea turtle rookeries in the world. Every year about 150,000 to 200,000 nesting turtles visit the beach near Gahirmatha, Orissa. Prior to 1975 ( when egg–gathering was banned ), about 1.5 million eggs were collected annually from this beach alone for local conservation and utilization in a planned manner. Some of the rural industries that can be set–up based on farming of sea turtles are:

a) using eggs for preparation of egg powder;
b) selling meat for food;
c) tanning of flippers for the preparation of fancy articles like handbags, gloves, etc;
d) utilizing various parts of turtles for making toys and decorative pieces;
e) supplying turtles and turtle products for scientific studies;
f) extracting oil.

## Discussion

**142.** During the discussion that ensued further elucidation of the use of wildlife as food by the nomadic tribes of Maharastra was given. The Consultation was informed about the use of wild animals as food by a tribe in Andhra Pradesh called "Madigas". The need for collection of quantitative data as against descriptive information was stressed. There is also a need to develop methodologies for the collection of economic data and for quantifying the socio–economic value of wildlife resources. Efforts should be made to collect data which will enable integration of wildlife management with overall land–use planning.

**143.** It was emphasized that there is a need to include both terrestrial and aquatic animals and plants in the wider definition of 'wildlife'. In addition to collection of data of a quantitative nature there should be study of all aspects of handling and processing of wild animals and products.

**144.** The Consultation was told that sea turtles are hunted in the Bali Island of Indonesia for food.

**145.** It was submitted that farming of wildlife in India has no place except for species like crocodile, some fishes and some birds. Ranching of other wildlife is practically impossible because the cattle population is high and all of the forest area is overgrazed. There is very serious competition for land and there is no surplus land which can be managed for wildlife farming.

## ECONOMICS OF WILDLIFE RESOURCES

146. *Mr. Shankar Ranganathan* presented the position paper for this section titled **"Ecological Planning for Prosperity"**. He said that health of the economic system and the biological systems are closely related. He reviewed the issues of unemployment and development of small scale and cottage industries in India and said that even if 1% of the value of the forests is set aside for reforestation, 20 million people can be productively employed in repairing the ravaged land. He said that man–made forests can be factories for the meaningful and productive employment of millions of people.

147. Game ranching is an economic activity and also ecologically sound. When a variety of animals (with differing food habits and therefore making use of various plant species) are raised together, optimum use of the land is made and maximum biomass per unit area is obtained. He said that fitting the animal to the vegetation might be a better approach than trying to fit the vegetation to the animal, especially on ranges that have been changed or degraded by man.

148. He quoted authorities saying that it requires about 2½ pounds of vegetation per day on a dry weight basis to sustain an animal weighing 100 pounds. Some 500 to 800 pounds of deer stock is needed to harvest 100 pounds. These rules of thumb, with modifications to suit local conditions, can be used in India for calculating the productive capacity of a range.

149. Animals which can be considered for game ranching in India are nilgai, chital, sambar, hog–deer, pig, and blackbuck. For meat production, the nilgai may be the most suitable since it weighs up to 500 to 600 lbs. and appears similar to the African eland which has been successfully bred.

150. There are two types of game ranches which can be considered. One would be a fairly small unit of 3 to 5,000 acres where animals could be reared for meat, hide or transfer. The other kind would be a much larger area of 50 square miles or more which could be managed as a commercial shooting block cum game ranch where conditions would be almost entirely natural with controlled licensed shooting combined with additional cropping for the market.

151. Fish farming is similar to game ranching and an annual crop of 5 tonnes or more per hectare of pond is already being obtained in various parts of India. In Thailand, fish farming is practised widely in paddy fields for the 4 or 5 months when rice is not grown and is the cheapest form of meat. Many people are employed in this activity.

152. An essential ingredient for success in such projects is the involvement of the rural people through employment and a fair share of the benefits such as a share of the meat, etc.

153. He gave the example of the crocodile farm near Bangkok as a successful commercial activity based on wildlife farming.

154. He also pleaded for utilization of the so–called pests like the "water Hyacinth" plant as pig feed and advocated raising energy plantations to meet fuelwood shortages.

155. For the prosperity of the majority he said that following the "ecological route" is the only viable course of action. He said barren lands in the country should be identified and industrialists should be encouraged to revegetate them by offering tax concessions and fiscal incentives.

156. *Mr. M.K. Ranjitsinh* of UNEP, Bangkok, presenting the paper "Wildlife Conservation for Economic Resources Enhancement" said that wildlife conservation does not only imply preservation – crucial though this may be in certain cases and in certain places – but the appropriate husbanding of this resource on a long–term basis to ensure optimum benefits. By abiding with ecological principles socio–economic goals can be achieved without entailing ecological disasters.

157. According to him four "areas" of wildlife management are distinguishable. Firstly, land may have to be allocated for strict preservation and protection of national and world heritages for aesthetic, recreational, educational, scientific, cultural, ecological and economic values.

158. National parks and reserves offer the best and often the only hope for the survival of genetic resources.

159. Wilderness areas are often important agents in absorbing adverse human impacts like carbon dioxide emissions and are amongst the most efficient natural recyclers of agricultural and industrial wastes.

160. Strict protection of certain areas is also essential to conserve important watersheds and prevent ecological disasters like floods and land slides.

161. Economic and ecological considerations are also prime reasons for strictly protecting some aquatic ecosystems: for example, coral reefs.

162. While dealing with the second category, namely, in habitats outside the "Protected areas system", Mr. Ranjitsinh cited some examples of the socio–economic importance of wildlife as a natural resource.

163. He stated that in many parts of the world the potential of wildlife for contributing to man's well–being is much greater than is appreciated by specialists and government authorities dealing with food and nutrition.

**164.** Regarding the third category where man largely lives and works, he said it would require the greatest degree of management, of choices of land–use, and economic consideration.

**165.** He said that a study would reveal that not only can a large majority of birds and many animals exist on farm and rangelands without causing any, or hardly any damage to agriculture, but in many cases they are an asset to it. Many farmers in Europe and America encourage the breeding of wild game birds and even game animals on their farm lands as a commercial proposition. Klussman (1966) reports that estimates showed that 13,000 landowners in the U.S. leased 22 million acres for hunting in 1965 and earned an income of 13 million dollars. As this game cropping was in addition to normal agricultural operations carried out on those farms, this outturn amounts to additional income derived from multiple land–use. In New Zealand a deer carcase can bring US$1,000, and and a stag can yield US$5,000 in antler harvests in its lifetime. 30,000 deer are kept on farms and the country exported 11 million US dollars worth of venison and another million from the sale of antlers. Deer farming has become an important cash crop in Chinese communes and a kilo of sliced, dried deer antler fetches 84 Yuan (1.62 Yuan per US$1 approximately). In Hong Kong the same commodity fetches US$100 per ounce.

**166.** It has been proven that in many agricultural areas of the world the productivity and economic returns from the land would be greater if they were converted to wildlife management or game farming. The reproduction ratio, adaptability to the environment and the efficiency in converting available nutrients into protein is much greater in wild ungulates than is the case with livestock, local or exotic.

**167.** The speaker then dwelt on the dangers of depletion of tropical forest cover and raising of large scale plantations of single species. According to him diversity and complexity are the very quintessence for the health of the environment. By simplifying the eco–systems man reduces their recuperative powers and thus often destroys them.

**168.** The speaker also reviewed the aquatic resources and the resources in zones inhospitable to man: the hot deserts and the cold artic and antarctic polar regions.

**169.** Summing up, he said that the argument for wildlife conservation is in reality an argument for more rational land–use. Wildlife conservation must be viewed as an integral part of the socio–economic and cultural life of the people.

**170.** *Mr. E.A. Sumardja,* Indonesia, presenting a paper "Economics versus Conservation", said that the strongest arguments for conservation are always economic and rational: if it can be demonstrated that it is more beneficial to use a given area as a national park rather than as a rubber plantation on purely economic grounds, then the battle for conservation is won.

**171.** A properly managed conservation area brings many benefits to the local people. Among the most important is watershed protection. National parks also aim at protecting the area from industrial logging, which seldom brings much benefit to the local people and in fact often destroys their environment.

**172.** Direct employment as guards, guides, and maintenance personnel is also possible, provided that the government policy is aimed at hiring local people whenever possible; experience has shown that reformed poachers usually make the best guides.

**173.** Well–managed national parks attract visitors and infra–structure such as roads and improved facilities, all of which have both direct and indirect benefits to the local people. In many areas where local people are dependent on forest products for the necessities of life, "buffer zones" can be developed and managed to meet these basic human needs.

**174.** The speaker concluded by saying that the question "Why Conservation?" should be answered by saying "for the lasting benefit of mankind". To the question "How Conservation?" the answer is "as an integral part of land–use planning and the state philosophy of development".

**175.** He pleaded that FAO should help the countries of the region to implement appropriate conservation policies.

**176.** *Mr. M.A. Rashid,* Chief Conservator of Forests (Wild Life) Gujarat, India, presenting a paper on game farming, said that the time has come to give serious thought to ensuring the increased involvement of private agencies such as village Panchayats and Tribal Cooperatives in this venture.

**177.** Any talk of wildlife conservation based purely on ecological and idealistic considerations would be meaningless to them unless they are offered adequate inducement to cooperate and collaborate with the authorities in wildlife conservation programmes. Actively involving them in a programme of game farming by creating the necessary infrastructure, making available the necessary technical know–how, and providing them with easy credit facilities and marketing services should be given sufficient importance.

**178.** *Mr. M. Kamal Naidu,* Curator, Nehru Zoological Park, Hyderabad, India, speaking on "Potentiality of Game Farmimg for Rural Development", reviewed the history of game farming and gave some international examples of successful game farming.

**179.** Citing from records he said that in the Nehru Zoological Park, Hyderabad, between 1965 and 1980,

chital increased from 25 to 165; 4 horned antelope from 6 to 34; sambar from 8 to 32; nilgai from 4 to 44; blackbuck from 6 to 14; hog deer from 2 to 32; and eland from 3 to 15. He also cited figures of breeding potential of animals in sanctuaries in India and some international examples.

**180.** Considering the literature consulted he concluded that it is possible to try out game farming in India on 400–500 hectares farm size, on a semi–intensive scale with mixed species of both indigenous and exotic species of ungulates, rodents, reptiles, birds and insects. Such a farm, after 2 to 3 years, can give a sustained harvest in perpetuity.

**181.** *Mr. N.M. Pillai,* Conservator of Forests, India, presenting the paper on "Game Farming for the Weaker Sections of Tribals in Kerala", said that the order of preference among the tribals of Kerala for wild meat is sambar, spotted deer, wild boar, bisons, langur, etc. He opined that sambar and spotted deer reared under semi–natural conditions breed prolifically when they are enclosed in a forest pocket of 50 acres with enough fodder resources. The breeding rate will be very high as the predator factor is totally absent in Kerala. For game farming, a total domestication of wild animals is not necessary. But under prolonged captive conditions they tend to become domesticated as there is constant human contact. A game farm has dual role to play: for meat and also for tourists.

**182.** He detailed a proposal for constituting a game farm in Kerala: an area of 50 ha. of forest land at Attapadi, which contains grasslands, open meadows with thin tree growth, will be fenced with 4" chain link net fixed to concrete posts erected at convenient intervals. The height of the fence will be 2 meters which will be sufficient for deer enclosures. Earthen dams will be erected across the rivulets flowing through the enclosure to form small reservoirs for the animals. Four artificial water ponds will be constructed to provide water during summer months. Two separate thatched sheds will be constructed inside the enclosure for the animals to take shelter in during the rains and also during the night. Fodder can be collected from the adjoining forests to feed the animals. The first year will be exclusively used for study for evolving principles of management of the game farm.

**183.** *Mr. L.A.K. Singh,* Research Officer, Orissa, India, speaking on the subject "Sanctuary Management as a Tool in Rural Development", said that while implementing conservation schemes it is necessary to intimately involve local people, and those habits, traditional or acquired, of the people, which hinder conservation should be skillfully eradicated or suitably replaced. Citing the example of the Crocodile Conservation Project, Orissa, he illustrated how villagers are benefited through such wildlife management.

**184.** *Mr. Ch. G. Mishra,* Wildlife Conservation Officer, Orissa, reviewed the wildlife resources of Orissa state. He said that 15 wildlife sanctuaries have been established in Orissa and briefly reviewed their status.

## Discussion

**185.** The discussion was initiated with a plea against Wildlife ranching from one participant who felt that economic pressures should not lead to exploitation of the beautiful wild animals as it may adversely affect the environment. A massive afforestation programme to improve the rural economy was suggested.

**186.** It was said that without a systematic study of wild animals and their life history meaningful programmes on wildlife management cannot be taken up. The consultation was informed that a scheme for breeding Elephants after a study of 100 elephants had been prepared.

**187.** The immediate need in India was said to be to see that wild animal stocks which have been depleted are increased in number first before projects for their utilization are mounted.

**188.** At this stage in the debate it was stated that while cultural and ethical issues no doubt are important, it will take a long time to arrive at a consensus and it was pointed out that conservation is the wise use of resources and includes direct utilization of the resource.

**189.** The need for utilization of Marine resources like whales and turtles was stressed.

**190.** It was also noted that there appears to be a conflict between conservation and utilization among the delegates. It was clarified that traditional conservationists value wildlife for its aesthetic value. However, these are mostly people whose basic needs have been met, whereas there is a vast majority of rural people who are poor and whose basic needs for food have yet to be met. For them the utilization of wildlife as food would be an appropriate solution. However, such utilization does not mean that wildlife will be destroyed as it has to be carried out along scientific lines.

**191.** It was stated that wildlife hunting for sport is an internationally accepted concept of wildlife conservation and sentiments should not be allowed to come in the way of a scientific management of natural resources.

**192.** It was noted that the theme of the Consultation is to use wildlife surpluses that will spill over from conservation efforts towards improving the rural economy.

**193.** The point was made that conservation and utilization of wildlife on scientific lines has been accepted and agreed to by the Indian Science Congress.

# WILDLIFE AND MEDICINE

**194.** *Dr. I. Sanjiva Rao,* Andhra Pradesh, India, presenting the position paper **"Forest Resources in Ayurvedic Phyto–Therapy – a Perspective",** said that ancient Indian treatises are replete with descriptions of forest products which have medicinal value. A recent work is the study "Ayurvedic Formulatory of India", which lists 351 drugs of plant origin. He said that the place of origin of the plant, the season and time of collection are very important when using a given species for preparing specific drugs. He advocated the implementation of a three tiered programme of collection, cultivation and preservation of medicinal plants. He stressed the need for training tribal people in scientific methods of identification of plants, methods of collection and preservation of collected forest products.

**195.** In his paper, *Hakeem Mohd. Zahoorul Hasan,* Principal, Government Wizamia Tibbi College, Hyderabad, India furnished a detailed account of how various parts of different wild animals are used in Unani medicine. He dealt with the therapeutic value of Musk deer *(Moschus moschiferus)* and antelope *(Cervus duvacuceli).* He emphasized the variations in the therapeutic value of different parts, organs and secretions of wild animals and gave examples. He stressed that the use of drugs of animal origin requires to be scientifically studied and empirical evidence should be collected on a systematic and sustained basis.

**196.** *Dr. Ramnivas Sharma,* of the Department of Indian Medicine and Homoeopathy, Hyderabad, presenting a paper an "Wildlife as an important source of traditional medicine in Ancient India" reviewed the references to animal and plant origin medicines made in ancient Indian scriptures and the reference book on Ayurvedic medicine: **"Charak Samhita".**

**197.** *Mr. K. Viswanathan,* Asst. Director, Wild Life Regional Office, Madras, India, expressed scepticism about the so called aphrodisiac and medicinal properties of wild animal derivatives. He felt there is much superstition in this field which is causing harm to wildlife populations in general. He listed the animals and birds which are being endangered because of their "alleged" medicinal properties. He called for scientific study and effective communication of results to people in general to dispel the myth regarding the medicinal properties of at least some of the widely hunted animals like Rhinoceros.

**198.** *Mr. V.V. Ramana Rao* of the Tribal Cultural Research Institute, Hyderabad, presented a paper on "Wild Medicines of Chenchus (a tribe in Andhra Pradesh, India)" in which he listed the medicines of mostly plant origin used by these people for treatment of snake and scorpion bites and some common illnesses.

**199.** *Dr. S.K. Negi,* of Indian Veterinary Research Institute, presented a paper on the "Ecological Impact of Animal Diseases", said that wildlife share many diseases in common with domestic animals and sometimes wild animals act as reservoirs and carriers of diseases. A strategy for control of these diseases should be worked out. Foresters and veterinarians should work in close liaison with each other and both should be trained to cope with diseases of wildlife.

## Discussion

**200.** During discussion, it was brought forth that China has a long tradition in the proper utilization of medicines containing animal products. In a book "Medical Herb Programme", written over 400 years ago, there are over 1,000 kinds of medicines listed of which nearly 400 are made of or contain animal parts. There are over 100 ready made medicines which contain the elements of deer, including young and old horns, heart, blood, meat, etc. These are very effective against heart diseases.

**201.** A meeting on the "Utilization of animals from South China" as medicines was held and this year another meeting is proposed on the utilization of animals from North China. Publication of a book on "Utilization of Wild Animals in Medicine" is also being contemplated. However, priority is being given to conservation and on this basis rational utilization is being carried out.

**202.** It was said that medicinal beliefs and uses of crocodiles and parts therefore are the main reason for the decline of the crocodile population in India.

**203.** A study was suggested of the comparative economics of raising wild animals for medicinal purposes-whether it will not be cheaper to go in for alternative modern medicines available in the market.

**204.** The inclusion of civet cat in the list of animals used in medicine was proposed.

**205.** The Consultation was told that in Himachal Pradesh musk is now extracted from musk deer without killing the animal.

**206.** It was suggested that as long as wildlife is looked upon as a resource we should be prepared to use it for any purpose, but care should be taken to see that no animal is brought to an endangered status while doing so. In addition, switching over to substitute products for some such endangered animals was discussed. For instance, sperm whales were killed for their oil. Now the same oil can be produced from a plant.

**207.** During the discussion on wild animal diseases, it was suggested that a ready made guide should be pre-

pared for use by managers of National Parks giving details of preventive and curative methods of wildlife diseases and that this can be one of the recommendations of this Consultation.

208. Suggestions were requested for new methods of injecting vaccine into wild animals, such as the injection of vaccine through drinking water with salt.

209. It was submitted that there is a need to examine some disease relationship problems on the basis that domestic stock may be the reservoir rather than wildlife.

## REGIONAL COOPERATION IN DEVELOPMENT OF WILDLIFE RESOURCES

### A Brief Review of Activities

210. *Mr. G.S. Child* of FAO reviewed the programmes and projects that FAO is currently undertaking in the Region to promote wildlife conservation and utilization.

211. The field activities of FAO can be classified into: a) Wildlife projects which are geographical area based which involve planning the management of wild land areas parks, reserves, etc., encompassing all stages of work right from preliminary survey to final stages and even implementation; b) Projects dealing with individual species management like Crocodiles, Deer, etc.

212. The activities of FAO in different countries reflect the needs and concerns of the country concerned and fill the gap in expertise in specific areas. In **India** FAO is involved in Crocodile management; in **Papua New Guinea** both Crocodile and Deer management are dealt with; in Indonesia Management of Crocodiles, National Parks management and formulation of a National Conservation strategy are receiving attention. In **Thailand** management of wildlife and National Parks; in **Sri Lanka** Capture and use of Feral buffalo; in **Burma** Crocodile and elephant management and wildlife survey and in **Bangladesh** Wildlife management training are dealt with.

213. Giving a resume of UNEP activities, *Mr. Ranjitsinh* explained that UNEP is interested in utilization of wildlife resources within the total context of the environment. UNEP is responsible for formulating the *World Conservation Strategy* along with IUCN and other international agencies. UNEP is also involved in the *Man and Biosphere* programme and in programmes specifically meant for the conservation of tropical rain forests. Other activities include encouraging of regional programmes in collaboration with other international agencies, conservation of coastal areas, exchange of animals, assistance in framing legislation, etc.

214. *Mr. Prakash* representing UNESCO said that UNESCO is involved in identifying areas that will contribute to the attainment of three basic objectives: (1) application of science and technology; (2) furthering of wildlife conservation; and (3) promotion and popularisation of scientific and cultural trends in the society at large. UNESCO operates through national commissions which channel funds to different countries.

215. *Capt. Tyabji* representing World Wildlife Fund briefly mentioned the activities of WWF in India.

216. *Dr. D. Bap Reddy* of FAO gave a brief resume of the global responsibilities of FAO towards conservation of nature.

### Regional Programme

217. The Consultation recognized that all of the countries in the Region face similar problems regarding the conservation and utilization of wildlife resources in order to improve the quality of life for the rural poor.

218. It was agreed that mutual cooperation among the countries of the Region would be the most effective approach towards achieving their common goal.

219. Thus, a project proposal for a regional programme/project was developed which emphasizes Technical Co-operation Among Developing Countries (TCDC) with maximum utilization of national institutions through the network approach and linkages with the national programmes. Financial assistance will be sought from UNDP or other funding sources on a priority basis.

# APPENDIX I

## PARTICIPANTS IN THE INTERNATIONAL CONSULTATION ON WILDLIFE RESOURCES FOR RURAL DEVELOPMENT

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Mr. Rattan Chand
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Mr. S. Chanda
Conservator of Forests & Ex–Officio Addl.Secretary
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## APPENDIX II

## INTERNATIONAL CONSULTATION ON WILDLIFE RESOURCES FOR RURAL DEVELOPMENT HYDERABAD JULY 7–11, 1980

### Agenda

Monday, July 7, 1980

a) Registration
b) Inaugural Session
c) Election of Chairman
d) Election of Rapporteur
e) Adoption of the Agenda
f) Presentation of the FAO Background Paper prepared by Dr. Boonsong Lekagul
g) Presentation of Country Statements:
   1) People's Republic of China
   2) India
   3) Indonesia
   4) Lao People's Democratic Republic
   5) Nepal
   6) Papua New Guinea
   7) Thailand
h) Discussion on the topic "*Wildlife and Improvement of Quality of Life.*"
i) Field visit to Vanasthali, Nehru Zoological Park and commemorative tree planting by delegates of participating countries.

Tuesday July 8, 1980

a) Discussion on the topic *"Wildlife Resources and Environment"*.
b) Discussion on the topic *"Wildlife Resources As Food"*.

Wednesday July 9, 1980

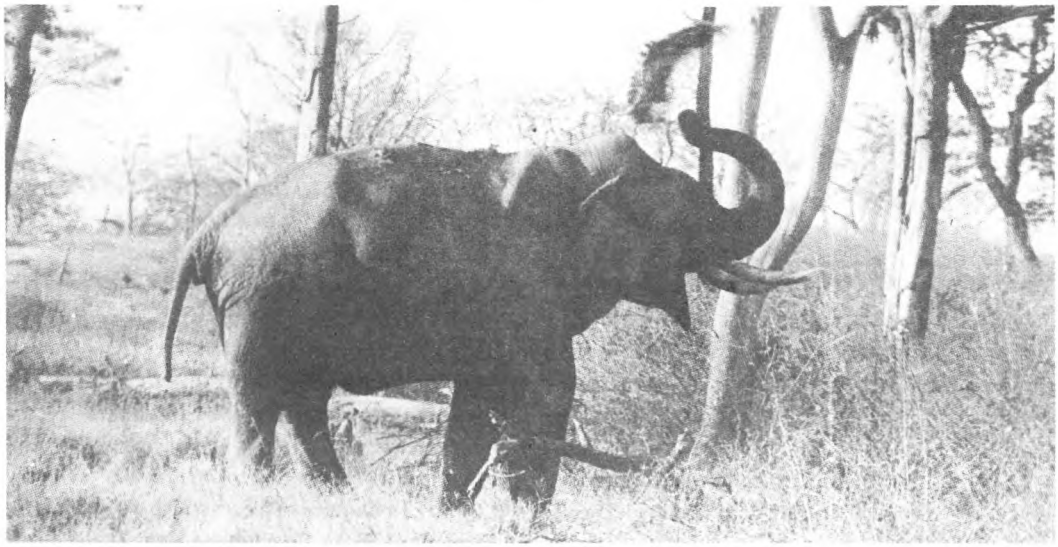
Discussion on the topic *"Economics of Wildlife Resources"*.

Thursday July 10, 1980

a) Discussion on the topic *"Wildlife and Medicine"*.
b) Discussion on the topic *"Regional Cooperation in Development of Wildlife Resources"*.

Friday July 11, 1980

a) Discussion on the topic *"Development of Regional Programme on Wildlife Resources For Rural Development"*.
b) Adoption of Recommendations and approval of Project Document on a Regional Project.



# APPENDIX III

## CONSULTATION ON WILDLIFE RESOURCES FOR RURAL DEVELOPMENT

### Statements and Papers:

### Inaugural Session

**Statements by:** Dr. D. Bap Reddy, Deputy Regional Representative, F.A.O. Regional Office for Asia and the Pacific
Dr. Channa Reddy, Chief Minister, Andhra Pradesh Government
Mr. Md. Hashim, Minister of Forests, Andhra Pradesh Government
Mr. J. Ragothama Reddy, Vice–Chancellor, Andhra Pradesh Agricultural University
Mr. P.S. Rao, Chief Conservator of Forests, Andhra Pradesh

### General Session

**Background Paper by:** Dr. Boonsong Lekagul, FAO Consultant
**Status Reports from:** China, India, Indonesia, Lao, Nepal, Papua New Guinea, Thailand

### Technical Session I *(Wildlife and Improvement of Quality of Life)*

**Papers presented by:**

| | |
|---|---|
| Mr. J.C. Daniel | – *Environmental Quality and Wildlife Resources"* |
| Mr. M.N. Raga and I.I. Ila | – *"Wildlife Resources and Improvement of Quality of Life"* |
| Mr. K.K. Mahajan | – *"Renewable Natural Resources and Quality of Life"* |
| Mr. Liang Chonggi | – *"Wildlife Resources and Improvement of Quality of Life"* |
| Mr. Saroj Raj Choudhary | – *"A Rural Reminiscence"* |

### Technical Session II *(Wildlife Resources and Environment)*

**Papers presented by:**

| | |
|---|---|
| Mr. Zafar Futehali | – *"Wildlife Resources and Environment"* |
| Mr. M.M. Jamkhindikar | – *"Environmental Impact on Wild Life Resources of Melghat Areas of Maharashtra State (India)"* |
| Mr. S. Mohammad Ali | – *"Wildlife and the Western Ghats"* |
| Mr. Zhao Qingru | – *"The Close Relationship Between Wildlife and Environment"* |
| Mr. Pong Leng–EE | – *"Present Status of Wildlife and National Parks in Thailand"* |
| Mr. S.K. Negi | – *"Ecological Impact of Animal Diseases"* |
| Dr. A.S. Kaikini and Dr. S.A. Chede | – *"Biometry of the Female Genital Organs of a Pantheress"* |

### Technical Session III *(Wildlife Resources as Food)*

**Papers presented by:**

| | |
|---|---|
| Mr. Madhav Gadgil | – *"Wildlife Resources as Food"* |
| Dr. J.B. Sale | – *"Importance of wildlife Foods in Rural Africa"* |
| Mr. C.S. Kar | – *"Role of Sea Turtles in Rural Development"* |
| Mr. D.B. Deb | – *"Edible Wild Plants of North East India"* |
| Mr. V.V. Ramana Rao | – *"Wild Plant and Animal Resources in Tribal Diets"* |

### Technical Session IV *(Economics of Wildlife Resources)*

**Papers presented by:**

| | |
|---|---|
| Mr. Shankar Ranganathan | – *"Ecological Planning for Prosperity"* |
| Mr. M.K. Ranjitsinh | – *"Wildlife Conservation for Economic Resources Enhancement"* |
| Mr. Effendy A. Sumardja | – *"Economics versus Conservation"* |
| Mr. M.A. Rashid | – *"Game Farming and Harvesting of WildLife Products Through Village Panchayats and Tribal Cooperatives"* |

| | | |
|---|---|---|
| | Mr. N.M. Pillai | – *Game Farming for the Weaker Sections of Tribals in Kerala"* |
| | Mr. M. Kamal Naidu | – *"Potentiality of Game Farming For Rural Development"* |
| | Mr. Ch. G. Mishra | – *"Wild Life Resources of Orissa and its Utilisation in the Development of the State"* |
| | Mr. Lala A.K. Singh | – *"Sanctuary Management as a Tool in Rural Development"* |
| | Mr. K. Prasad | – *"African Ivory Trade in India"* |
| | Mr. Shankar Ranganathan | – *"Game Ranching – A Productive Use of Marginal Land in India"* |

**Technical Session V** *(Wildlife and Medicine)*

**Papers presented by:**

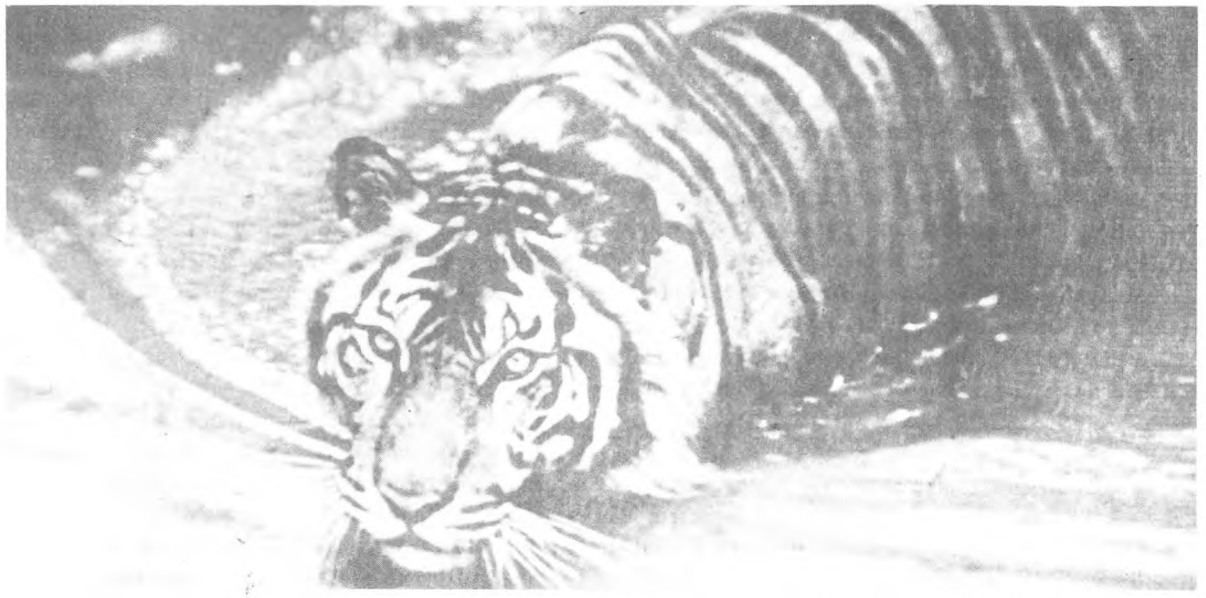
| | |
|---|---|
| Dr. I. Sanjiva Rao, Dr. Purushottam Das Jopat, Dr. P.V. Raj and Dr. K. Pratap Reddy | *"Forest Resources in Ayurvedic Phyto-Therapy – A Perspective"* |
| Mr. Hakeem Mohd. Zahoorul Hasan and Mr. Hakeem Mohd. Fazlur Rahman | – *"Wild Animal Drugs Used in Unani Medicine"* |
| Dr. Ramnivas Sharma | – *"Wild Life as an Important Source of Traditional Medicine in Ancient India"* |
| Mr. K. Viswanathan | – *"Man, Medicine and Wildlife"* |
| Mr. V.V. Ramana Rao | – *"Wild Medicines of Chenchus"* |

**Technical Session VI**

**Statement by** Mr. G.S. Child – *"Role of FAO in Regional Wildlife Management Programme"*

**Additional Publications Received:**

*"Wildlife Resources in Rural Development"*
(Souvenir Booklet)
*"Diseases and Treatment"*
(Pamphlet distributed by Hamdard Laboratories)
*"Makara – Vol. 2: No. 1, April 1980"*
(News Letter of the Central Crocodile Breeding and Management Training Institute, Hyderabad)



". . . but care should be taken to see that no animal is brought to an endangered status. . ."

# APPENDIX IV

## PROJECT DOCUMENT – OUTLINE ONLY

## TITLE : REGIONAL PROJECT ON WILDLIFE RESOURCES DEVELOPMENT AND UTILIZATION FOR RURAL POOR IN ASIA AND THE PACIFIC

**Duration : 5 Years.**

### I. Development objectives

1. To ensure the more effective conservation and management of the Region's valuable but diminishing Wildlife Resources and their habitats.
2. To reorient policies relating to promotion, conservation and utilisation of wildlife resources to meet rural needs more fully and directly and in accordance with the principles and programme of action of the World Conference on Agrarian Reforms and Rural Development.
3. To provide a regional forum for sharing information and developing approaches towards problem solving in the broad field of wildlife resources for Rural Development.
4. To promote a network of institutions dealing with the subject in the different parts of the Region; to establish linkages and generate active technical co–operation among developing countries of the Region.

### II. Background And Justification

The Asia and Pacific Region (RAPA) extends over more than 30 countries and contains a population which is roughly equal to half the world's population.

In RAPA there is a wide range of ecological diversity from tropical rain forests to alpine pastures. There is a great variety of flora and fauna. The region is the home of several species of crops, fruits, forest trees, carnivores, ungulates and primates. There is even representation for that unique group–Marsupials, in Australia.

More than 2,000 million people, about half the world's population, live in rural areas. In the RAPA Region alone about 500 million people have to live in desperate poverty. These undernourished people generally suffer from severe protein deficiencies and malnutrition.

A majority of the rural people in this Region have very little access to animal protein, be it from fish, meat, milk or wildlife. In fact, the only animal protein available to some comes through wildlife hunting. A great variety of wild animal foods are still popular today in Asia and Pacific; these range from bats, squirrels, rabbits, monkey, wild boars to deer and antelopes. *However, very little quantitative data on the use of wildlife for human food are available and there are hardly any studies on this subject pertaining to Asia Pacific Region.*

Besides food, wildlife resources can contribute to rural incomes: skins of deer, antelopes and crocodiles and ivory, horns and teeth of several animals are valuable. They also furnish ingredients for medicinal preparations. Tourism and export of zoo animals are well known examples of "non–consumptive" uses of wildlife resources.

This great potential for developing wildlife resources to provide rural people food and employment needs to be explored. Rural development strategies, policies, programmes and projects which combine short term measures to ensure human survival with long term measures to safe–guard the resource base should be formulated and implemented. Currently, lack of information is proving to be a serious bottleneck for developing appropriate programmes and projects.

This information gap needs to be remedied.

In the field of crop husbandry significant breakthroughs have been achieved in increasing food and agro–based commodity supplies from cultivated land Marine and fresh water resources have been exploited to spur fish catch and production. From all evidence the harnessing of wildlife resources for alleviating rural poverty has yet to gain acceptance. A number of studies should be carried out before this concept can be translated into viable project ideas.

For example: in several countries of the region there is a growing recognition that wildlife farming is one of the methods that can be adopted to utilize wildlife for rural people. However, such farming, to be successful, should be concerned with certain profitable species and requires a great deal of organisation. Choice of wild animal species suitable for farming requires detailed knowledge on aspects such as: rate of reproduction, meat yield, resistance to disease, behaviour under controlled conditions, ease of rearing, the quality of the product, market for the product, and the economics of the enterprise.

Careful planning of the farm, its operations, training of staff and marketing are essential requisites in setting up these enterprises. Establishment of National Parks which can provide the animal breeds, and suitable conditions, both ecological and scientific, for wildlife farming will enhance the chances of success of such farms.

There is a pool of experience already available in the region on this subject. For instance, there are several successful experiments in this field now in operation in some of the countries of this region and outside. There are deer farms in New Zealand; Musk deer farms in People's Republic of China; Crocodile farms in several countries including India and Thailand. In Papua New Guinea, there is a programme to harvest deer on a large scale, besides crocodile farms. There is a government programme to assist interested villagers in methods of collection, farming and marketing butterflies and other insects.

A major argument which justifies the launching of the Regional Project is it assists member governments to evolve a development strategy, *per se*, for wildlife resources using Technical Co–operation among Developing Countries as a means.

## III. Activities

1. To collect and disseminate information on;
   a) Existing practices of utilizing wildlife
   b) The end–uses of wildlife products
   and
   c) Successful examples of sustainable utilisation of wildlife primarily as food and for generating incomes in rural areas.
2. To advise and assist governments to carry–out in the establishment of wildlife farms primarily for benefitting rural communities.
3. To advise and assist govermnents to carry–out ecological surveys, prepare management plans and, where feasible, establish Buffer Zones for sustained development of wildlife resources to benefit local communities.
4. To develop methodologies and carry–out techno economic evaluation of selected wildlife projects in the region and widely disseminate the information.
5. To initiate broad based as well as specific studies on demand and supply, price trends and market potential of wildlife products.
6. To assist member governments in evolving the appropriate institutions/ organisations/ structures to ensure participation of the people who are directly affected by the programme and who are the likely beneficiaries of the programmes.
7. To assist member governments in formulating policies and strategies for utilizing wildlife resources for rural people.
8. To formulate a pilot project for utilization of Buffer Zones for Wildlife farming and assist in its execution in a selected country.
9. To formulate regional, sub–regional and national projects for fulfilling the training requirements at professional, technical and vocational levels in the broad field of wildlife conservation and utilization.
10. To assist member governments in initiating a conservation education programme in the universities and schools, including the development of curricula for various types of courses.
11. To assist member governments in mounting programmes of conservation awareness among the general public through appropriate mass media and specialised techniques.
12. To assist member Governments to hold national workshops to discuss problems in managing wildlife for rural development and develop approaches to problem solving.
13. To organize specialized training courses for specific purposes, study tours and fellowships.
14. To promote an awareness regarding the existing international conventions concerning wildlife conservation and encourage member governments to become signatories to these conventions, especially CITES.
15. To promote cooperative measures among the member governments of the region leading to standardisation of terms, developing regional standards for managing parks and reserves, regional cooperation on migratory species etc.
16. To identify areas of priority research and assist in promoting programmes of research.
17. To prepare manuals on various aspects of ecology, biology and management of wildlife and National Parks including a manual on diseases in wildlife and remedies.

## UNDP INPUTS:

### PROJECT PERSONNEL: ESTIMATED BUDGET FOR 5 YEARS.

| | M/M | Amount (US$ 1,000) |
|---|---|---|
| **Experts:** | | |
| Project Manager (Wildlife Conservation and National Parks Management) | 60 | 370 |
| Expert (Information Exchange: Wildlife) | 60 | 300 |
| Expert (Training) | 60 | 300 |
| **Consultancies:** | 100 | 1000 |
| Economic Studies | | |
| Market Studies | | |
| Curriculum Development | | |
| Wildlife Farming | | |
| Buffer Zone Management | | |
| Ecological Surveys | | |
| Unspecified | | |
| **Travel** | | 500 |
| **Training:** | | |
| Group Training (100 MM) | | 500 |
| Fellowships (100 MM) | | 300 |
| **Supplies & Equipment:** | | |
| Office & Other Equipment | | 500 |
| Vehicles | | 100 |
| **Office Support** | | 200 |
| **Miscellaneous** | | |
| **Operation & Maintenance of Equipment/Vehicles** | | 200 |
| **Reporting Costs** | | 100 |
| **Sundry** | | 130 |
| | **Total** | 4500 |

NESTING LEATHERBACK returning to the sea *J. P. Schulz*

Protection of endangered species, a vital concern; development without destruction.

1st INTERNATIONAL WORKSHOP
WILDLIFE RESOURCES IN RURAL DEVELOPMENT
JULY 7th TO 11th 1980.

DON BOSCO PRESS